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ELECTRICAL TRADES REVIEW

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CONSULS AND FOREIGN TRADE.

PEOPLE who find anything to criticise in home institutions are very prone to imagine that things are very much better done abroad. Of late years, since the question of how to extend our foreign trade has become a live one with so many manufacturers, much censure has been expressed against the consuls of the United States for their failure to become salesmen and force our goods upon foreigners in every land. Again, many complaints are made of the blindness of our merchants and manufacturers in not more generally availing themselves of the information collected by some of the more energetic of the United States consuls and printed for free distribution by the government at Washington. In every case the custom is to couple with these complaints a reference to the great value to British trade of the consuls of that country and their reports.

It may be of interest in this connection to mention that a prominent English journal devoted to exports in the manufacturing and engineering trades contains in a recent issue an editorial that reads for all the world as if it had appeared in a New York newspaper, except that the object of its criticism is the British consular service, and not that of the United States. A special point in the article relates to "the true John Bull obstinacy" of the British trader who, instead of availing himself of the information already given by the consuls, persists in sending out price-lists and catalogues, not only in a language which the recipients do not understand, but also in specifying quantities, prices, weights, and measures of which the receiver has neither knowledge nor appreciation. Again, according to our contemporary, it is constantly a matter of reproach that the British trader is too inflexible in regard to the styles of the goods which he sends out, and does not pay sufficient attention to the varying requirements of the importing countries. Wonderful to relate, the editor of the journal quoted goes further and asserts that he knows, "on the best authority," that in America and in Germany they do these things better than in Great Britain. A year or two ago we had occasion to note that somebody in France was agitating the question of making the consular service of that country as efficient in promoting commerce as that of Great Britain.

Probably a canvass of the whole subject would show that one country is about as well off as another in the quality of the service rendered by its consular representatives, and also that in every country traders neglect to take advantage of such service as the consuls do stand prepared to render. As a matter of fact, the consuls of each country are appointed in order that they may be of benefit to its commerce already existing with foreign countries, and to protect the interests of its citizens abroad. The primary object of their appointment is neither to promote the foreign demand for the products of their respective countries, nor to become salesmen and fill such demand as may already be found to exist. At the same time, however, it has become the custom of our government—as of many others—to call upon its consular representatives

from time to time for information respecting trade in certain lines, and to publish the results of inquiries for the benefit of those who may be interested. It happens thus that the consuls of the United States, some of whom have been men lacking in neither ability nor enterprise, have written reports full of suggestions of the greatest value to merchants and manufacturers who will take the trouble to read and act upon them.

But no matter how well the work of the consuls is performed, the business of manufacturing the right kind of goods for foreign trade and of placing such goods before consumers in those countries must depend upon the manufacturers and merchants themselves. In this respect there is more reason for criticising traders for their lack of intelligence in dealing with foreign markets than in criticising the most inefficient consul who has ever gone abroad as a representative of our government. Many visitors to the World's Columbian Exposition, who saw there for the first time the infinite variety of sizes and styles of rubber shoes in existence, marveled at the pains taken by our manufacturers to supply as far as possible every taste and requirement on the part of the buyers. But this relates mainly to tastes developed in our own country. Some of the same manufacturers who were represented by exhibits at Chicago have failed in creating a demand for their goods in foreign countries on account of their refusing to understand that while they make thousands of different shoes for the home trade, something still different may be desired by Englishmen or Germans when they buy rubber footwear.

This is as good a place as any for referring to a recent letter in the London *Daily News* from an English engineer living in Brazil. He complains that Englishmen will not take the trouble to convert their "hodge-podge mixture of weights and measures" into the metrical system. Hence many Brazilian buyers do not understand how to handle the English goods, having no basis of comparing them with Belgian and French goods, the weights and measures of which are expressed in metrical terms.

COMMUNICATION WITH BRAZIL.

RECENT interruptions of telegraphic communication with Brazil prompt the *Boot and Shoe Recorder* to remark upon the beauties of governmental control of the telegraphs. In this instance no end of annoyance has been caused to the crude-rubber and coffee trades, and undoubtedly considerable loss has been experienced in some quarters. Our contemporary is right in pointing out this latest argument against removing telegraphic facilities from private control where they have not yet become a part of the machinery of government. But so far as interference with the trade in rubber is concerned, there is very little probability that the Brazilian government, as a whole or in its various component parts, will ever proceed further than to cause some interruption in the use of the cables when free communication might open the way for the plans of some petty faction temporarily in charge of public affairs to promptly reach the opposing faction. As is succinctly set forth in an article on another page of this journal, the Brazilian republic is a government neither of the people, by the people, nor for the people. The strength of the comparatively few persons who form the government there is mainly exerted in retaining office long enough to collect their salaries for a few months, and the business of gathering and selling rubber and coffee proceeds in obedience to the world's demand for those commodities by citizens who know little of the affairs of government and who probably care less. The rubber district in Brazil, by the way, is almost as far from the federal capital at Rio as it is from New York, and it is probably more remote when measured by normal facilities for communication.

INDIA-RUBBER INSULATION.

OUR readers cannot fail to be interested in the article reproduced on another page from the *Electrical Review* (London), in which the merits of India-rubber for submarine-cable insulation are set forth with so much discrimination. Certainly the examples pointed out by our contemporary make a most favorable showing for India-rubber in a field in which, according to popular conception, Gutta-percha has heretofore stood alone. The demand for submarine cables is one which must develop steadily with the world's progress, and many notable men of science already have deplored the danger which they supposed to exist of the total extinction of Gutta-percha before a satisfactory substitute could be discovered for it in the work of submarine cable construction. Whatever may be true of Gutta-percha, no reasonable person need longer give himself trouble over the possibility of the future scarcity of India-rubber. If it should prove true that the latter gum has all the good qualities that Gutta-percha possesses in the field of insulation, and possibly some peculiar advantages, the field will be opened for an extension of the India-rubber industry already carried on, and the world at large as well as the rubber-manufacturers will be gainers.

A POINT that future manufacturers of rubber boots will do well to bear is one just brought out by a rubber-man. A very successful manufacturer of boots built a new factory equipped almost exactly as his first factory was, and started it up on the manufacture of these goods. With the same skilled help, the same kind of machinery, and absolutely the same compounds, they find it impossible to make the same goods. This case is not a singular one, as there is something in the business that new manufacturers rarely take into account, and yet that have been occasions for the loss of considerable money. It is thus impossible to predict what the goods will be until they have been turned out; indeed, until the factory has been running a long time and the product has shown in itself what it is. In some cases this has cost millions of dollars before the goods were right. All of which shows how impossible it is to answer inquiries for books that will tell how to make rubber goods.

VINDICATION OF INDIA-RUBBER FOR SUBMARINE INSULATION.

From the "Electrical Review" (London).

EXTENSIVE as is the network of submarine cables which now interlaces the surface of the globe, there is no indication that the completion of the same is within measurable distance. It would, perhaps, be difficult to point out in what direction extensive developments of submarine telegraphy may be expected, but that the progress in the future will be slow is hardly probable; hence the question of what is to be the type of the future cable may afford reasonable grounds for speculation. We do not intend here to discuss the question whether the present form of cable is likely to prove, in the course of a few years, to be an obsolete one, as Prof. Silvanus Thompson imagines it will, and with good show of reason, but we would consider what is likely to be the future as regards the nature of the insulating material to be used for cable purposes.

The knell of Gutta-percha has, in the opinion of some, been sounded; but the fate of this material is probably not so near as many wiseacres have predicted, for we can call to mind more than one instance, dating back at least a decade, in which we were informed with great assurance that five years would see an end to the use of the material, and yet at the present time we see cable after cable being turned out from the manufacturers' works, and still of the same tried composition. Nevertheless, there are not wanting plain indications that there must be a limit to the supply of Gutta-percha, and pending the cultivation to maturity of Gutta-percha trees, a matter which may posssibly be taken in hand, it behooves us to be ready with a substitute which can be obtained in quantities commensurate with the demands which may be made.

Leaving aside the possibilities of paper and other substances coming to the fore (and it is quite on the cards that they will), at the present time there is no material which offers so much promise as India-rubber. The history of this substance for use in submarine telegraphy has been, as all telegraph engineers know, a chequered one. Many disastrous failures resulting from its use seriously shook public confidence in it, and the uniform success which Gutta-percha gave naturally resulted in the preference being given to the latter, and were it not that the supply of the gum threatens to give out, it is more than probable that India-rubber would, as an insulator in submarine telegraphy, still be left in the background. Now, however, that the question must be faced, what are the actual facts as regards India-rubber?

Much will be learned by a perusal of the article on "Hooper's Core for Submarine Cables," which we give elsewhere.* That India-rubber can be depended upon is, we think, amply proved by the facts there set forth. It hardly requires to be said that a guarantee to maintain a cable with an India-rubber core for a period of twelve years was a risk which no manufacturer would undertake, were he not absolutely certain that the material could be relied upon for durability. The success of the experiment (if we may call it such), is one upon which we most heartily congratulate Mr. J. P. Hooper, and is one which is not unlikely to restore confidence in, and to extend the use of, rubber.

It is, perhaps, almost unnecessary to restate what has often been pointed out, viz., that the supply of India-rubber, unlike that of Gutta-percha, is almost unlimited. Gutta-percha trees take many years to come to maturity, and unless they are "bled to death," afford but a comparatively small supply of the substance. This is not the case with India-rubber; these trees are more widely spread, grow rapidly, and afford an abundant and continual supply of the gum, and the "milking" process is not an injurious one. It might be imagined that the failure of rubber to give satisfaction in the earlier days of submarine telegraphy was due to a great extent to unskillful manufacture. This, however, is not the case, as the processes by which the late Mr. Hooper made rubber to be a practical insulator, though now comparatively ancient history, are still the processes of the present day, and leave nothing to be desired; what failures took place were due to imperfection in mechanical details. With reference to this, it should be pointed out that when Hooper's rubber was introduced as a competitor to Gutta-percha, the price of the latter was not what it subsequently became, and consequently a cable with a rubber core could not be produced at a remunerative price unless the weight of rubber used in proportion to the copper of the conductor was much less than in the case of Gutta-percha. It seems highly probable, therefore, that in this respect a mistake was made, and that for mechanical reasons, if more rubber had been used, better success would have been obtained. That rubber still gives satisfaction is proved by the fact that the Cuba Submarine Co. continue to specify for the material (Hooper's) for their extension.

* The article referred to [*Electrical Review*, September 22, 1893] recites the history of the Pará-Cayenne-Demerara cable, on the South Atlantic coast, in which Hooper's core was used, embodying India-rubber insulation, but with unsatisfactory results. It now appears that not one of the faults removed from this cable by the repairing parties could be traced to bad manufacture or to broken wires, but were due to external causes after being laid. Owing to the abandonment of the cable it was generally thought that the insulated wire known as Hooper's core would never be employed again for submarine cables. But, recognizing the importance of counteracting this impression, Mr. John P. Hooper, after the decease of his father in 1878, determined to prove that the aspersions cast upon the qualities of his father's core were unfounded. Some sections of deep-sea cable remaining at the Hooper Telegraph Works were spliced into a cable which was laid between Cienfuegos and Santiago by the Cuba Submarine Telegraph Co., in February, 1881. The terms of the contract made the Messrs. Hooper responsible for the cable for twelve years, including all accidents of every kind and faults of manufacture, if any, the cable being paid for in yearly instalments. The cable worked without accident for ten years, when a break occurred in 500 fathoms, owing to the nature of the bottom. This break was repaired and the cable again has been satisfactorily operated. Last month saw the expiration of twelve years' working during which Mr. John P. Hooper guaranteed to maintain the cable. After mentioning some other examples of cables with rubber core, the *Electrical Review* says: "Looking to these facts, and seeing that the War office and the Admiralty have continued to employ this core for their torpedo cables, we cannot but think that in the future Hooper's core is likely to prove a formidable rival to Gutta-percha."—THE EDITOR.

What, it may be asked, are the special advantages of rubber for submarine-cable insulation, seeing that from the point of working speed it possesses no advantage over Gutta-percha; and seeing that as regards price (at present) it also presents no marked advantage? It is, we believe, a fact, though not a well-known one, that the high insulation of the rubber, and the nature of its substance, renders the detection of faults of manufacture a much easier and more certain matter than is the case with Gutta-percha, and that consequently a submarine cable with rubber insulation, if it has passed the ordeal of the manufacturer's tests, may be absolutely relied upon not to develop faults when laid, excepting, of course, faults due to mechanical injury taking place after submersion. Again, rubber, unlike Gutta-percha, is not attacked, except on the surface, by the teredo worm; consequently the expense of protecting brass tape is unnecessary. The fact that it will bear uninjured a high temperature is an important point in connection with its use in hot climates, the usual precautions of keeping the temperature down before the cable is laid, and when being laid, being in this respect unnecessary. Moreover, contrary to what is generally understood to be the case, the process of jointing is easy and certain; joints which have been made in a very indifferent manner by unskilled workmen have been found to be perfectly efficient and durable; and although the complete process of making a joint is a comparatively long one, it does not require the same amount of skill as Gutta-percha.

At the same time, rubber core is not suitable for conditions of alternate wet and dry, unless well protected; it has failed when used as the leading-in shore-ends of cables; but inasmuch as it can be readily jointed to Gutta-percha, this is not a point of importance in the case of submarine cables. For electric light leads the use of India-rubber is accepted as a matter of course, no one doubts its suitability for the purpose, and the fact that other materials are used is solely due to financial considerations. For submarine-cable work, an insulator other than either Gutta-percha or India-rubber would hardly be entertained, and there does not seem much probability for some time to come of the two gums in question having any serious rivals. Let the rubber-manufacturers, therefore, show that they can fairly compete in price with the hitherto more popular gum, and they will have matters all their own way.

THE MODERN KNIGHT IN SUBMARINE ARMOR.

"THERE were never so many diving suits in use in this country as there are to-day," said one of the few New Yorkers interested in making these goods. "You have seen maps published by the religious denominations with a little red cross to mark the location of each church? Well, sir, if there were such a map showing the spot where every diving suit is at present in use, you would see our whole Atlantic coast dotted with red crosses. Every old suit in the country has been hunted out and patched up and set to work.

"It's an ill wind, you know," he continued. "An ill wind made this sudden and unexampled demand for diving suits. The great storm of a few weeks ago broke things up more or less in almost every harbor along the eastern coast, north and south, and immediately there began a demand for divers with suits. This immediate demand shows what wonderful recuperative powers this country has. If we have a disaster on Monday night, we begin to make repairs on Tuesday morning. The wind had hardly gone down before scores of divers were at work. It was not only with sunken vessels, although, of course, they made a large share of the business. It was for almost every purpose you can imagine along a seacoast. Damaged wharves demanded the services of hundreds of divers—first to locate and estimate the damage, then to repair it.

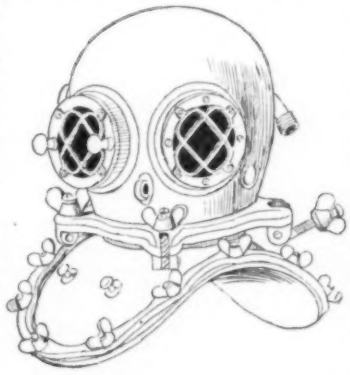
"Submarine diving has been reduced to such an exact science that there is little work under water that the expert diver cannot do, and it is hardly more dangerous than similar work on the surface. It is a great wonder, though, that more lives are not lost at it, all things considered. You can take a good modern diving suit and go and sit on the bottom of the North river as safely as you can sit on the wharf. But see how some of the suits are handled. A shipping merchant in some distant place, say on one of the smaller West India Islands, sends to New York for a diving suit, because once in five or ten years it is necessary for him to have the bottom of a ship examined, and there is no dry dock handy. Nobody in his country has ever seen a diving suit, or knows how to use one. After being used by some plucky waterman, it is hung away till the next occasion comes. Hot weather acts upon the rubber, moths act upon the canvas, salt air acts upon the metal, and in a few years the suit is a wreck. But it is still a diving suit, and its owner sees nothing the matter with it. Still there are very few accidents, even with such suits.

"There is only one manufacturer of submarine armor in this city, and he makes the diving apparatus for the United States navy and the Engineering Department, for the Russian navy, and for several South American navies. Twenty-six suits have been made this year for our Navy Department. Minor improvements are making in the suits constantly, but the greatest change within a few years has been in the manner of attaching the helmet. But you must know first how submarine armor is constructed, before I can explain this to you. You have the common notion, I suppose, that if you just have a diving suit you can do all the diving you wish. That is a very erroneous idea. The suit is a small part of the necessary apparatus. For instance, you can buy a diving suit for $40, of the best quality; but before you can make a dive you must have apparatus which, of corresponding quality, will cost you $687.

"As the pay of a diver is only $5 a day and his work very uncertain, you will readily imagine that the divers do not own their own suits. The suits are bought by wrecking companies and other corporations, and they employ the divers. The most expensive thing about the outfit is the

THE DIVER READY TO DESCEND.

air pump, and the next is the helmet. The diving dress proper is made of India-rubber, laid between two layers of canvas, the rubber being entirely covered. A copper collar, which fits over the shoulders, chest, and back, is fastened to the rubber suit with twelve bolts. To this collar the helmet is attached. Formerly the helmet was screwed to the collar, but the recent improvement I mentioned is the fastening of the helmet with bolts, which is much stronger and safer. The helmet is made of sheet copper and weighs about thirty pounds. It has three eyeholes, one in front and one on each side, all filled with half-inch thick glass, and protected with strong copper wires. On one side is a valve which allows the foul air to escape, and at the back is a copper pipe to which the breathing tube is attached. The sleeve wrists are made of strong rubber, which keeps the water out. The shoes have iron soles which weigh over twenty-five pounds each. The heavy leather belt is lined with blocks of lead, weighing in the aggregate 100 pounds. The suit complete weighs about 225 pounds, and on the surface it is very burdensome; but in the water it feels no heavier than an ordinary suit of clothes. The helmet is always the last thing put on. When the diver comes up for a breathing spell the helmet is not taken off; one of the eyeholes is unscrewed, which answers every purpose.



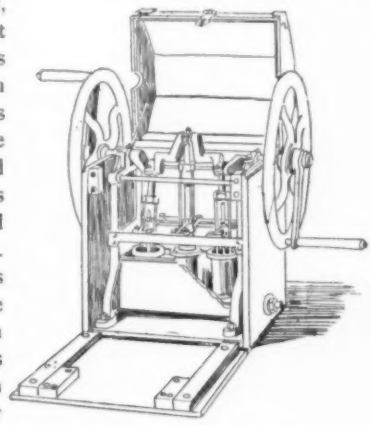
MODERN HELMET, BOLTED TO METAL COLLAR.

"The life line, as we call it—the rope with which the diver communicates with the surface, and with which he is hoisted when necessary—passes through a ring in the helmet, and after being bolted in several places to the collar on one side goes through a ring in the belt, and is then bolted to the collar on the other side. This is not only a life line, but a telegraph line, too. One pull means 'more wind'; two pulls, 'less wind'; three pulls, 'stop the pump for a moment.' You see, the air supply is the main thing, and most of the things relate to it. But the diver may have too much air as well as too little. The air pipe is made much heavier and stiffer than ordinary rubber hose. If it were too limber it would get into 'kinks,' and shut off the air.

"Three men on the surface attend to one diver—two to work the air-pump, and one for the air tube and life line. They must be trustworthy men, too, or they will kill the diver. Some companies make it a point to employ father and son, or two brothers, or very close friends. While one relative dives, the other exercises great care on the surface.

"I have told you only of the larger parts of the outfit. The complete apparatus, the $687 worth, consists of a three-cylinder air pump, with water tank around the cylinders to cool the air, a brass-trimmed oak case for the pump, a bolt helmet, the diving dress proper, 150 feet of air hose, a set of belt weights, a pair of loaded shoes, a pair of wrist expanders, a pair of rings and clamps, a pair of diving mittens, a pair of chafing trousers, a life line, six extra bolts and nuts for the helmet, a pair of extra couplings, a yard of repair cloth, six feet of snap tubing, a box of rubber cement, and a cutting punch.

"Encased in this armor the diver keeps as dry as a chip, and, of course, the pump gives him plenty of air. But I do not say that he is altogether comfortable. When the water is cold the diver is cold, and requires one or two suits of heavy flannels and woolen mittens to wear beneath his diver's mittens. In clear water he can see very well, but about this harbor the water is not clear, and most of the work must be done by feeling. In fact, it is very hard work; so hard that four hours is counted a full day's work. Formerly the divers' wages were much higher, but they have come down. [New York divers probably run less risk than any others in this country, because they do more work and know how to keep their apparatus in order. Very much depends upon that, but not everything. Occasionally an accident happens in spite of all the care possible. The last fatal accident to a diver in this harbor that I remember was several years ago. A steamship had sunk near her dock, and a diver went down to see how she lay. He felt his way along her deck up to the bow, for the water was too muddy for him to see much. It was too muddy, indeed, for him to see that one of the anchors lay on its side with a fluke in the air. As he went up one side of the deck and down the other his life line passed around the anchor. On completing his work he gave the signal to be drawn up, but when his companions drew on the line they only pulled him toward



THREE-CYLINDER AIR-PUMP.

the anchor. He could not see what was wrong, but he managed to get hold of something to cut the line. Unfortunately, instead of the life line he cut the air tube, and before he could be extricated he was drowned. The men on the surface immediately dived for him without any armor, but they were too late.

"The New York divers are pretty much the only ones in the country who have nearly steady work. This is because they work all along the coast. Divers in other Atlantic coast cities do only local work, but the New York divers all work for the wrecking companies, and they are sent everywhere."—*New York Sun.*

* * *

THE Hodgman Rubber Co. (New York) practically supply the demand in the United States for the rubber parts of diving suits. Mr. George B. Hodgman said recently to a representative of THE INDIA RUBBER WORLD:

"The trade in these goods is fairly large, and is slowly increasing. The United States does not import any diving-suits. Occasionally helmets are sent here from other countries to have suits fitted to them. The chief users of the suits are the navy, the dock departments of cities, and private wrecking companies. Private divers following the business on their own account also buy suits. A suit lasts a long time and the divers can easily repair them. The statement in the *Sun* that 'hot weather acts upon the rubber and that in a few years the suit is a wreck,' is erroneous. Properly vulcanized rubber is not affected by any sort of weather, hot or cold, and the rubber used in diving-suits is of the very best quality. In fact, there is only one kind or quality of diving-suit made, and that is of the best rubber to be had. As life is at stake, the utmost care is taken to comply with the conditions of durability and safety. There are, of course, several sizes made. The price of the rubber part of the outfit is about $40."

JAPANESE RAIN-COATS.

By Loie Vorrath.

CIVILIZED man, the world over, loves comfort. Give him the material comforts of life and he will endure without a protest the pangs of an uneasy conscience. Put physical ease in one side of a scale and moral satisfaction in the other, and the latter "kicks the beam." Under these circumstances, it is nature alone that can cause him any discomfort. It is only the savage that maintains a calm indifference in the face of her wrath, shrugs his shoulders and pursues the even tenor of his way. But his civilized brother looks on her tears with dismay, and it has been said that this most natural instinct is what first gave to an obscure rubber-clothing manufacturer the opportunity of his life. Nature's tears are as wet as any other kind of tears, and if there is anything a man hates it is to get wet. Most American men know enough to come in when it rains, but they have not always the time to do it.

Now, in Japan, it is different. Everybody has plenty of time there. In fact they have so much of it that it was many a long day before it occurred to them that it might be a good idea to save one's self a wetting. They thought it over and rather liked the idea, which, having taken root some two centuries ago—when the Portuguese first entered that country—is already beginning to bear fruit.

The Japanese has a natural antipathy for anything new. Consequently it was with growing suspicion that he regarded the clothing of the foreigners. It was the hat of the soldier, however, which incurred his especial aversion. This was called the *capa*. There were two kinds of capas. One was a cap; the other was a hat. The former had a visor in front and bore a strong resemblance to that now worn by a European stage-driver; the latter was the regulation cocked hat. These were made of thin brownish oiled paper, quite rain-proof.

As the newness wore off, the Japanese's prejudice dwindled, and it was not a great while before the *kappa*, as they called it, came to be quite popular with merchants and workmen. The light weight and simplicity of these hats offered a welcome contrast to the national headgear and they were soon universally adopted.

The wheels of progress grind slowly in Japan, but they grind exceeding sure. Soon after this the Japanese set about to invent an article that would protect the dress from rain. An oil-skin cocked hat was all very well in its way, but it was open to objection on the ground of insufficiency. The result was a garment for men which they called the *mino*, and another, the *uchikake*, for women.

The mino was made of a layer of straw upon a woven frame of hemp. Little loose straws, attached to the body of the garment by one end, were thus made to swing like tassels, and were really effective in preventing the rain from soaking through. The mino was shaped like our cape coat, with a cape reaching to a little below the shoulder. The uchikake was a more pretentious garment. It was made of black, rough chintz, or of uncut velvet, and its shape was the same as that of the common dress, the *kimono*, only larger in every way, so as to cover the whole dress. Instead of being fastened with a sash as the kimono is, it was held together in front with the left hand.

It seems as if invention pursued a downward path with these people, for the next thing in the way of rain-shedders was the last. Beginning with the head, they finished with the feet. They built a kind of abbreviated stilt, which, it will be readily seen, is a good enough way to keep one's self "high and dry." The Japanese rain-shoe was made sometimes of wood and sometimes of straw. The wooden shoe, called *gita*, was shaped like an oblong with the corners rounded and was secured to the foot by means of two cords of leather or of silk, fastened at the end, and passed between the large toe and the one next. The whole thing was mounted on a couple of wooden pins five inches high.

The *waraji* was another kind of wooden shoe, differing from the gita only in that it was cut oblong without the

rounded corners, and was worn only by women. These did very well for a time, but the thirst for improvement had taken possession of the people of Japan. The next thing they did was to provide their shoes with a leather cover called *tsumahake*, which completely covered the top of the shoe and projected several inches on either side. Thus the toes were protected from the mud.

Another variety of footwear was a sandal made of straw. These were of ample proportions, also cut round, and were secured to the feet by means of cords of straw, fastened at the heel and then passed between the toes, as in the gita. The sandals were much more useful than the gita and waraji to travelers, as they rendered locomotion less difficult. Their light weight also made them popular with workmen, for whom the wooden shoes were much too cumbersome.

With these three articles,—a kappa, a mino, and a pair of gitas,—the Japanese was wont to consider himself well equipped for a battle with the elements. The rain-shedders played no mean part in the love affairs of the men and women of the day. In the age of General Shogun, if a lady looked upon a man with favor, she would send him her uchikake, which he would don on every rainy day, never missing an opportunity to parade his good fortune except when called to war, when with deep regret he would substitute his mino.

These garments continued in use with little changes up to 1885. It was not until thirty years after the signing of the treaty between Japan and the United States, which made of Japan an open port, that the European mantle was imported. An era of progress was thus begun which swept away many of the old customs. The mino is rarely seen now, though the uchikake has not yet disappeared, nor has the kappa. The ladies still wear the chintz uchikake and the workmen the kappa; while a few farmers and fishermen are wearing out their old minos, eagerly looking forward to the day when a new coat shall be the need of the hour.

With trade in this condition in Japan, the remark of a New York newspaper that "several bird-hunters in this city have bought Japanese rain-cloaks and rain-hats" is interesting. The article goes on to say that a number of art students intend to adopt these cloaks during the summer. Here are two men in different parts of the world, each of whom has what the other wants. The soul of the Jap hankers after a rubber coat, and his western brother ransacks New York in an effort to find a Japanese rain-shedder. What's the matter with free trade?

THE MANUFACTURE OF RUBBER CLOAKS IN GERMANY.

RECENTLY we procured [says *Die Gummi-Zeitung*, of Dresden] an article from Paris, in regard to the manufacture of French cloaks. Now we have endeavored to obtain a statement from the leading firm of Germany, and we do not neglect to point especially to the fact that this branch of German industry has been developed to a high state of perfection. [The statement follows:]

THE manufacture of rubber coats has been carried on in Germany for about thirty years, during the first fifteen years of which, when glossy rubber goods were yet manufactured exclusively, it was of no great consequence. With the employment of double textures it assumed more prominence, but, depending entirely on England for the material, the sale was confined to Germany, the German manufacturers not being able to compete with the English product in foreign trade.

At that time there were in Germany about twelve to fifteen cloak-manufacturers, differing not widely in production and capacity. A different aspect presented itself when we at last, after much work and persistent experiments, succeeded in manufacturing the raw stuffs for the production of double-texture coats in Germany. The German manufactured goods being superior in design and color, we were able to emancipate ourselves from the importation of the English-made goods. By saving the import duties we were enabled to offer lower quotations, giving more brilliant colors and more elegant designs. We were still depending on England, however, for the waterproofing. Although rubber factories existed in Germany, the coating of raw materials was to them almost unknown, so little being done in that line that they lacked practical experience. It was to our own interest, therefore, to acquire the knowledge of rubber-coating, and after many trials we at last succeeded in producing so brilliant a coating that the same, at equal prices, far exceeded the English product in quality. We were therefore the first to introduce into the markets of Germany home-made rubber stuffs, which gave the whole cloak-manufacture of Germany a different aspect.

While our competitors still endeavored to compete with us in the more expensive English goods (having to pay duties on the same), we were in a position to produce more elegant garments, made from German materials, at much lower prices, and thus our goods were given the preference by German consumers. Soon we were enabled to compete successfully with England and France in foreign and transatlantic countries, a fact which had but a few years before seemed an impossibility. A considerable portion of our manufacture reaches Austria, Holland, Switzerland, Roumania, Scandinavia, the Orient, Spain, Portugal, South America, etc.

We employ in the manufacture of cloaks about one hundred and fifty persons. None but the best Pará rubber is used by us for waterproofing, and by a special process our cloaks are rendered odorless, sewed and cemented, and of such a style that they cannot be distinguished from the tailor-made goods. Special attention is given to the cutting and working of the collars, which are treated in the same manner as the cloth ones, unlike the straight and clumsy English- and French-made collars, which spoil the appearance of the whole garment. The German-made

rubber coats are superior in all respects—fit, style, width and accuracy—to the foreign-made goods.

The style for gentlemen is almost exclusively the double-breasted ulster with belt; for export Havelock patterns seem to be preferred. Ladies' cloaks are coming into favor again,—at least the orders of last season gave promise for a prosperous business in those goods for this year. Besides the much admired Havelock patterns in all varieties Paletots will also be worn again the next season. The materials for ladies' as well as gentlemen's waterproof clothing will mostly be in checks in small pattern.

We would also call attention to the manufacture of the light "dusters," made out of so-called electric stuffs, which two or three years ago became quite prominent, but the enthusiasm of the ladies for that article seems to be on a down-grade. Also the beautiful light half-silk goods which had a transparent waterproofing on one side, were in great demand. The manufacture of these light cloaks is in the hands of costumers.

OPPENHEIM & RAPPOLT, Hamburg.

THE RUBBER-FOOTWEAR TRADE IN EUROPE.

*An Interview with George H. Hood.**

GEORGE H. HOOD is treasurer of the Boston Rubber Co. Mr. Hood is a rubber-manufacturer of large experience. He has been successful in various branches of this business. He has manufactured rubber belting and other kinds of mechanical goods. For many years he has made a standard line of wringer-rolls. He is a successful manager of rubber clothing and mackintoshes. He is also at the head of the Boston Rubber Co., which is manufacturing the "Bell brand" of rubber boots and shoes. What he is likely to say about the rubber trade is sure to be a matter of importance. Mr. Hood spent two months of the past summer abroad. While on the other side of the Atlantic Mr. Hood was most interested in securing a much-needed rest. He was on vacation, but found time to make some observations on the rubber-manufacturing industry in its present development in European countries. In making these observations Mr. Hood was able not only to compare the present stage of the industry there with that in our own country to-day, but also with what it was in Europe some years ago when he was previously abroad. Mr. Hood has just returned and kindly consented to an interview for *Facts*.

"Why," he was asked, "are rubber boots and shoes not so generally worn in England as here?"

"Their leather shoes are heavier," said Mr. Hood. "The lower classes wear heavy, coarse shoes, because they are cheap and serviceable. Among the better classes it is an almost universal custom to wear heavy walking boots when out of doors. The English are an out-of-door-loving people. They spend all the time they can out of doors. They walk much and nearly all wear heavy walking boots. Even among the ladies the custom of wearing slippers and light shoes while in the house and heavy shoes when out is much more prevalent than here. Then, too, the climate is against the general use of rubber footwear. Rains are frequent. During much of the year the weather is very similar to that which we experience in a New England April. If an Englishman commenced wearing rubbers it would be necessary for him to have them with him most of the time, for they might be needed any hour. These frequent mild rains, which are a characteristic of the climate, have led to the general use of heavy walking boots, but have prevented the growth of a custom of wearing rubbers.

"On the other hand, the very conditions which have worked against the general use of rubber footwear have worked in favor of waterproof clothing. England leads the world in the use of mackintoshes, it being more general among her people than elsewhere. The comparative low cost of English woolens enables English mackintosh-manufacturers to undersell the world on these goods, but since very few English mackintoshes are vulcanized or stitched they are not so reliable as the American product. The rubber-surface clothing produced in England is made in a different way from ours, is much cheaper and very much inferior.

"I understand there are but two mills in the British islands manufacturing rubber footwear,—one at Liverpool, the other at Edinburgh. Neither of them is equal in capacity to any one of our moderate-sized mills. The goods they produce are heavier and clumsier than ours, being also inferior in style, finish, and, as I believe, in wearing qualities.

"On the continent, outside of Russia, I know of but two mills making rubber footwear. One is in France, a little outside of Paris, the other at Mannheim, Germany. Both are largely owned and operated by the Hutchinsons, who are Americans and were formerly connected with the industry in this country. The boots and shoes that they make are not up to the standard of the American product. Russia is the country in Europe for rubbers. The climatic conditions are the most favorable for the development of the industry. There are many points of excellence about the rubber footwear made by the Russian-American Rubber Co., at St. Petersburg. Their finish is especially fine. Their outfit is so abundantly supplied with lasts and they have so much room at their mill that the shoe is allowed to remain on the last longer after varnishing and before it is packed than is the custom here. Their goods are heavier and not so stylish as ours, but are excellent in quality. They are sold largely in Germany, many considering them better than the German home product. The truth is, however, while abroad I saw no rubber boots and shoes of foreign make equal to the 'Bell brand' of rubbers."

"In your opinion can American-made rubber boots and shoes be sold successfully abroad in competition with the home product?" was asked.

"Yes, sir; I have taken the preliminary steps looking toward the sale of the 'Bell brand' of rubber boots and shoes in Europe. I am confident that a market may be created in the British islands and France, at least for American rubbers. As far as it has been tried, it is a success. In the cities our light, stylish goods are especially popular. Americans, of whom many are abroad at all times, prefer them, as do also the natives themselves after once trying a pair of American rubbers. Not only do our manufacturers lead the world in the manufacture of rubber footwear, but they also control a large share of other forms of rubber manufacture. We are to-day the largest producers of rubber threads for elastic webbings and shoe-gorings in the world."

*Reprinted from *Shoe and Leather Facts* (Philadelphia).

A COUNCILMAN at Conshohocken, Pa., has proposed an ordinance requiring the railroad companies to place rubber tires on all locomotives and cars that run through the town.

BRIEF ABSTRACTS OF RECENT RUBBER PATENTS.

AMONG recent patents issued by the United States Patent Office, embodying applications of India-rubber or Gutta-percha to a greater or less extent, have been the following.

It is not practicable here to do more than to note the use of rubber in each case, with sufficient detail to enable those who are interested to decide whether or not to look into any particular patent more fully:

TIRES.

No. 501,967.—Wheel-Tire. John T. Smith, Bridgeport, Conn., assignor of one-half to Arthur Herbert Smith, New York city.

The combination, in an elastic tire, of a notched webbing, a crown thereon, and lobes or flanges projecting from said crown.

No. 501,992.—Vehicle-Wheel. David Crowther, Huddersfield, England.

The combination, with a flexible tire having an outer arched bearing surface, flat outwardly diverging sides, an inner arch, an air space between the said arches, and an open space below the inner arch, of the sheets or layers of canvas, forming a lining to the inner walls of the arches.

No. 502,002.—Pneumatic Tire. Rudolph W. Huss, Chicago, Ill., assignor to Charles G. Page, trustee, same place.

A pneumatic tire having a reinforcing fabric formed with the warp or longitudinal threads which run along the tread portion of the tire and which are capable of longitudinal elastic stretch, and with warp threads running along the sides of the tire and not adapted for longitudinal stretch.

No. 502,003.—Pneumatic Tire and Device for Inflating Same. Thomas B. Jeffery, Chicago, Ill.

In combination with an inflatable tire having a compressible inflating tube, the rim in which such tire is seated having an aperture through which the inlet tube protrudes, and a marginal bass about one side of said aperture on the surface of the rim opposite the tire seat, and a lever pivoted to the rim and having a tongue corresponding to the concavity of the marginal bass to compress the inlet tube against said bass when the lever is moved on its pivot toward the latter.

No. 502,047.—Pneumatic Tire. Fred. W. Morgan and Rufus Wright, Chicago.

A hollow or pneumatic tire comprising a tubular sheath having a limited split or opening for the insertion and removal of an air tube, and an air tube having flattened end portions and confined within the sheath and having its flattened end portions removably held between the sheath and the inflatable portions of the air tube.

No. 502,048.—Pneumatic Tire. F. W. Morgan and Rufus Wright, Chicago, Ill.

A hollow or pneumatic tire comprising a sheath, and an inclosed air-tube having closed flattened ends and a normally flattened inflatable portion, said inflatable portion of the air-tube being of such size relatively to the internal diameter of the sheath that the inflation of the tire shall not materially stretch the air-tube,

No. 502,390.—Bicycle-Tire. John A. Wright, Indianapolis, Ind.

That method or process of constructing pneumatic tires which consists in treating rawhide with glycerine or a glycerine preparation, and cutting and molding it to the desired form, and interposing the same between the layers of the ordinary substances, and cementing the whole together into one homogeneous mass, whereby a hollow or pneumatic tire is produced with a substantially impenetrable outer surface.

No. 502,447.—Wheel. George B. Ont, Syracuse, N. Y., assignor of one-third to Randolph C. Vetter, same place.

In a wheel, a tire having separated edges, a rim having side shoulders for engaging the outer faces of the tire edges, a band encircling the rim and having its outer edge provided with a shoulder for engaging the inner face of the adjacent tire edge and having its opposite edge bearing against the outer face of the rim, and a second band encircling the rim and having its outer edge provided with a shoulder for engaging the inner face of the opposite tire edge and having its opposite edge bearing against the outer face of the adjacent side of the former band.

No. 502,731.—Cushion Tire. Woodburn Langmuir, Toronto, Canada.

An improved cushion tire, comprising an inner metal band bolted to a felly by a hollow bolt, an outer metal band, a rubber band placed between said inner and outer bands; and a bolt projecting through the rubber and metal bands and into the hollow bolt.

No. 503,300.—Valve for Pneumatic Tires. Charles K. Welch, Coventry, England, assignor to the Pneumatic Tyre and Booth's Cycle Agency, Limited, Dublin, Ireland.

The combination, with the air tube of a pneumatic tire, of a valve constructed with a flanged head placed inside said air tube and a stem projecting through the wall of the air tube, said stem being provided with an axial hole which communicates with the interior of the air tube by an orifice in that face of the head which comes in contact with the wall of the air tube, and means for forcing the said wall of the air tube against the said face of the head.

No. 503,560.—Pneumatic Tire. George F. Callaghan, Baltimore, Md., assignor of one-third to Edwin D. Durborow.

In a bicycle tire, the combination of the metal rim having a circumferential groove, at each side of which is an inturned hook, a tire made of segmental air-chambers, each having a positive acting valve which projects into the circumferential groove; and a cover inclosing all the air-chambers and having along each edge a beaded hook.

No. 503,565.—Pneumatic Wheel-Tire. Otto F. Persson, Saugus, assignor of one-half to Hjalmar C. Sehelin, Boston, Mass.

The combination with an expansive or inflatable wheel tire, of an internal ring armor, consisting of two superposed layers, each composed of narrow strips with abutting edges and the strips of one layer breaking joints with the strips of the other layer, and an elastic sheet or band which holds the two layers in proper relation to each other.

No. 503,594.—Pneumatic Tire. Williston W. Greenwood, New York city.

In combination with a wheel rim of rigid material supporting thereon an inner tube impervious to air, said inner tube being confined by an inextensible, flexible covering,—clamping devices consisting of continuous, or jointed inextensible, longitudinal bands or hoops of rigid material, which bands effect the clamping of the edges of said inextensible, flexible covering between themselves and said wheel rim by means of the increasing diameter of said rim at its outer edges, the bands being held to their positions against the coned rim on the side away from the axle of said wheel by the tension existing in the covering and induced by virtue of the compressed air within the inner tube, the edges of said inextensible, flexible covering being furthermore prevented from slipping through by enlarged borders.

No. 503,660.—Pneumatic Tire. Thomas D. Glen, William Purvis, and Sydney Smith, Glasgow, Scotland.

In the tire, the combination with the rim having beadings of the rubber tube capable of being inflated, a canvas covering outside of such tube having one of its edges constructed in a loop or fold containing a wire cord or chain, and the rubber tread having one of its edges resting against the edge of the canvas so reinforced.

No. 503,704.—Wheel-Tire. Charles F. Lorender, Toronto, Canada, assignor of one-half to Thomas Fane, same place.

The combination with the air tube and the base or bolster

adapted to rest upon the wheel rim and provided at its edges with annular ridges or enlargements, of an open-sided envelope for the air tube having a lining provided with enlarged edges which bear against the inner sides of the ridges of said bolster.

No. 503,724.—Pneumatic Tire. Frank H. Mason, Akron, Ohio.

A bicycle-tire, comprising in combination an outer envelope having a slit of limited length and provided with lace holes on the flaps of said slit, an inner tube having a tubular strip secured by one face to the inner tube and having perforations in the other face, and lace passing through the lace holes in the flaps and strip.

No. 503,846.—Detachable Tire. Arthur C. Gillette, Jersey City, N. J.

As an improved article of manufacture, a detachable tire and guard, formed of flexible material and provided upon its face with projecting spurs, and at its ends with fastening hooks, the fastening hooks being arranged at the outer edges of the tire, said ends being termediate of the said hooks.

No. 504,032.—Tire. Squire Green, Stratford, England.

In a tire for bicycles and other vehicles, the combination of a tubular tire divided into a number of sections by transverse slits or slots with an outer tread and covering of rubber, an intermediate protecting covering of a hard material wound round under the cover to produce projection thereon.

No. 504,135.—Pneumatic Tire for Wheels. James B. Ratsbun, New York city.

An inflatable tire provided with a diaphragm to form two chambers and a filling tube for one of the chambers extending through the other secured at one end to the diaphragm and movable with it, and at the other to the tire wall, said tube being otherwise disconnected from the walls of the tubular tire, whereby it is free to vibrate about its stationary end, the tube being disposed longitudinally of the tire in the chamber through which it passes, to permit of such vibration.

No. 504,144.—Pneumatic Tire. Thomas J. Williams, London, England. Assignor to Sydney Lee, same place.

A new article of manufacture, a retaining tubular pocket for pneumatic or air-inflated tires formed of canvas or other fabric, having a woolly or nappy exterior surface impregnated with powdered rosin or cognate substance.

No. 504,284.—Fastening Device for Pneumatic Tires. John Samuel Smith, Christopher John Tate, and George Edward Tate, London, England.

The attachment of the pneumatic tires to the rims of wheels by means of wires passed through pockets in the edges of the jacket or cover of the tire and engaging with the spokes of the wheel.

No. 504,413.—Wheel for Cycles. Alfred C. Brown, London, England.

In combination with a wheel having an inner rigid rim, on which springs adapted to outwardly thrust an outer connecting flexible band are secured, blocks or buffers of rubber, cork or its equivalent, serving to absorb or lessen the final shock in case of abnormal compression of such springs.

No. 504,468.—Pneumatic Tires. Douglas Dobbins and Richard McKenney, Franklin, Ind.

In a pneumatic tire, a protecting strip consisting of an elastic base piece, and a number of narrow longitudinal strips of flexible impenetrable material, one central strip wider than the other strips, and beneath it a narrow strip, both centrally attached to the base piece and parallel strip on each side of such central strip, each attached near its outer edge to the base piece and the inner edge overlapping the adjoining strip.

BOOTS AND SHOES.

No. 502,275.—Overshoe. John F. Bullard, Swanton Junction, Vt.

A rubber or overshoe having around its mouth upon the outside thereof a narrow overlapping automatically contracting elastic strip the upper edge of which is contracted inwardly, said strip terminating at the opening at the front upon opposite sides of the same and around said opening terminating at the top edge of the upper. The herein described method of applying a narrow elastic strip to the mouth of a rubber, which consists in expanding the strip to the desired length dependent upon the amount of curve required, and while in this state of expansion cementing the strip to the outer upper edge of the mouth of the rubber allowing it to dry and contract to curve the upper edge inward.

DRUGGISTS' SUNDRIES.

No. 502,590.—Window Garden Spray. Benjamin F. Sill, Long Island City, N. Y.

In a window garden spray, the filtering cup and valve chamber constructed in one piece of elastic material, the valve chamber having inward projecting valve lugs made of and integral with the elastic material, in combination with the valve constructed of elastic material, and a filter ring with its filter cloth set within the mouth of the filtering cup and held in place by the elastic pressure of the material composing the cup, and protected therein by the projecting rim or extremity of the filtering cup.

No 502,994.—Atomizer. Isaac L. Gurnee, Butler, N. J, assignor to the Butler Hard Rubber Co., New York city.

The combination of an air supply tube, a liquid tube, an air tube, a bushing or sleeve within the air tube and outside the liquid tube and concentric with both the air and liquid tubes, said bushing having an axial opening there—through and a lateral opening therein, the latter communicating with the air supply tube.

No. 503,837.—Atomizer. William J. Evans, New York city, assignor to McKesson & Robbins, same place.

In an atomizer, the combination with a liquid holding cup, of a suction tube leading out from the base and forming a part thereof, a drip flange on the suction tube having a lip projecting over the edge of the cup, an air pipe and an air forcing device connected to the air pipe.

No. 504,058.—Flexible Water-Bottle. Francis M. Underhill, New York city, assignor to Whitall, Tatum & Co., same place.

The combination, in a water-bottle, of a rubber body, having a suitable neck, a sleeve surrounding said neck, and entirely on the outside thereof, said sleeve being adapted to receive also a stopper.

No. 504,138.—Water-Bottle Stopper. George H. F. Scrader, New York city.

A screw stopper consisting of two parts, the one constituting the outer end of the stopper and having a nozzle, and the other united thereto, constituting the inner end of the body, and carrying a valve constructed when in one position to permit communication through the body to the nozzle, and when in the other position to close such communication.

No. 504,424.—Surgical Catheter. Oscar de Pezzer, Paris, France.

As a new article of manufacture, an elastic flexible catheter, having a tubular stem provided at the end to be inserted into a cavity with a perforated dish shaped enlargement whose faces extend at substantially right angles to the stem.

INSULATED WIRE.

No. 503,601.—Electric Cable. Milo G. Kellogg, Chicago, Ill.

The combination of the individually insulated wires laid up in cable form with their insulations in contact as usual, individually uninsulated wires occupying the spaces or angles between the insulations of the other wires, and an exterior envelope or sheath surrounding the assemblage of wires.

MECHANICAL GOODS.

No. 503,849.—Horseshoe and Pad. Michael Hallanan, New York city.

The herein described horseshoe pad, comprising a backing of leather, a facing of rubber, and an interposed metallic plate, the leather and rubber being united by a row of stitching extending around outside of the metallic plate.

THE VULCANIZATION OF WATERPROOF FABRICS IN ENGLAND.

IN a report of Mr. Fawsitt's paper on "Dry Heat Vulcanizers," recently read before the Glasgow section of the Society of Chemical Industry, the remark was made that practically no discussion ensued, owing to the subject being unfamiliar to the chemists present. With the view of removing this professed ignorance of chemists generally, rather than of giving any new information to those familiar with the subject, we give the following particulars regarding an industry which has attained to large dimensions—perhaps larger than is generally supposed. To begin then, caoutchouc, or rubber as we prefer to call it here, is well known to be affected by extremes of heat or cold, and although from the time of the first application of waterproofing by Macintosh in 1823, to the discovery of vulcanization by Goodyear and Hancock in 1845, the goods were used in the unvulcanized state, at the present all the waterproof goods made are put through some sort of vulcanizing process to overcome the above-mentioned defects. With regard to the word "vulcanize," if we consider its mythological origin, it is clearly a misnomer in the case of the "cold cure" to be mentioned later on, but we prefer the word to "sincalor" (*sine calore*), which is largely used in this connection—although a barbarism that perhaps would not commend itself to the strict philologists. Though this word is in constant use in the rubber trade, we have noticed that its derivation is not at all familiar to those using it. This, however, is only a small matter, and hardly of technical importance. We therefore return to our subject proper.

Of late years there has been a great development of the waterproof trade in the direction of increased variety in the fabrics employed. In fact, fifteen years ago the number of cloths used for the purpose were very few, but at present we see an almost endless variety of wool, silk, and cotton goods, alone and in combination with each other. Scotch and Yorkshire woolen tweeds now constitute the largest portion of the dealer's stock-in-trade, the black or blue paramatta—a mixture of wool and cotton—being conspicuous. We mention these facts because the nature of the cloth has to be considered before it is submitted to any vulcanizing process. To briefly summarize the "spreading" part of the process, we may say that the rubber is mixed with sulphur or other curing agents and is rolled out into thin sheets and dissolved to a paste in coal naphtha. This paste is then spread on the cloth by the knife edge of what is known as the "spreading-machine." The spread cloth passes then over a steam chest, whereby the naphtha is volatilized and the rubber left as a thin coat. Several of these coatings are required to make up the necessary thickness of proof, and then the material is ready to be vulcanized. This is done by one of three processes—viz.: (1) steam cure; (2) cold cure (Parke's process); (3) dry heat.

In the first process the proofed cloth is rolled round a sheet-iron drum, and exposed in a "vulcan pan" to high-pressure steam at about 275° F. for an hour or more. This process is not much used for fabrics, as it is found impossible to ensure equal heating owing to the non-conducting nature of the material, whereby the outside layer is overheated before the inner is heated sufficiently. In the second or cold cure process, the vulcanizing agent is chlorid of sulphur. This is dissolved in bisulphid of carbon in the proportion of 1 to 40 parts by volume. In applying this process the rubber surface is made to pass over a roller which is kept revolving in the solution. In spite of the disagreeable nature of the chemicals, this process has been and is very largely used, though the "cure" is not a complete one, being merely effected on the surface where the solution has come in contact with the rubber. As we do not consider the process a satisfactory one, we are glad to state that the use of the mephitic liquid bisulphid of carbon, with its attendant fire risks, is likely to become obsolete, a satisfactory substitute having been found for it. The liquid being merely a vehicle for the chlorid of sulphur to ensure the absorption of the latter by the rubber, it is clear that as long as it has a solvent action on the rubber its chemical constitution is of no great moment.

The cold cure, so long without a rival, has been supplanted to a great extent by the third, or "dry-heat process," which, although used to a certain extent for some time, was not worked on a large scale until, in 1877, Mr. Waddington invented his improved dry-heat stove. This stove consists of a long wooden chamber lined with zinc and fitted in its interior with a system of rollers so arranged that the cloth occupies, in its passage, the necessary time to effect vulcanization at the one operation, and, being continually on the move, no portion can receive more or less heat than another. In this way the rubber coating is vulcanized all through, and not merely on the surface, as in the cold cure. It may be asked, whether the dry heat injures the textile fabrics. There is, however, no fear of this if the process is carefully carried out, and the heat is not allowed to rise higher than is absolutely necessary. When cured by this process the goods can be depended on to remain soft and pliable during the cold weather, and, what is even of more importance, they will not decompose by being kept in stock in a hot climate. It is to this dry heat method of vulcanizing that Mr. Fawsitt's paper referred, and he claims that, by the employment of metallic iodides—notably those of antimony, lead, and tin, in conjunction with sulphur—the proof can be cured in a shorter time and at a lower heat than when sulphur alone is used. We agree with the author that the cost of the iodide is likely to mitigate against its adoption, but at this early stage we shall not attempt any criticism.

Some chemical readers may be inclined to ask, how is this vulcanizing action to be explained? We may reply that there really is very little known regarding the true

EDITORIAL NOTE.—This article, reprinted from *Industries* (London), refers at the beginning to a paper by Mr. Charles A. Fawsitt, reported in this journal in the issue of July 15, 1892.

nature of the change, whether it is a true chemical reaction or merely a physical one. It is generally stated that in the ordinary vulcanizing process, when a mixture of rubber and sulphur is submitted to high-pressure steam for an hour or so, 3 per cent. of sulphur is chemically combined, the rest being physically held and capable of abstraction by solvents. Some expert experience, however, leans to the opinion that not more than ½ per cent. of sulphur is chemically held if insolubility in caustic solutions is to be taken as a proof of chemical combination. The reaction with chlorid of sulphur is generally allowed to be due to the substitution of hydrogen in the rubber by chlorine. That a substitution compound exists is shown by passing a current of chlorine gas into a solution of rubber in chloroform, when a white solid body is formed, and hydrochloric acid is evolved. A similar reaction occurs in the case of bromine, though we have it on the authority of Gladstone and Hibbert that no reaction whatever occurs in the case of iodine. Chlorid of sulphur is found to be the most practical way of applying chlorine to rubber, though many other compounds of chlorine act in a similar manner. We shall not now pursue the subject further; we hope enough has been said to bring home to the general chemist the meaning of such terms as "dry heat" and "cold cure."

THE INFLATION OF TIRES.

THERE is much diversity of opinion as to the degree of hardness which it is desirable to develop in pneumatic tires by means of the inflator. The condition in which different riders maintain their tires shows that popular ideas on the subject vary considerably, for while some keep them soft and readily compressed by the fingers, others inflate them to such an extent that it requires a great effort to indent them appreciably by the same means. It has been satisfactorily established by practical experience that a hard-pumped tire is less liable to puncture than one that is only partially inflated. It is difficult to account for the more yielding material getting pierced with greater readiness than that which offers an increased resistance to penetrating substances. As might be expected, the correct degree of inflation will be found to be somewhere between the extremes of softness and hardness mentioned above. An unduly soft tire is liable to be compressed when meeting an obstacle, to an extent which causes the material of which it is composed to become impinged between the road and the rim, when it is very liable to sustain injury. On the other hand, the advantage of the air tire is greatly reduced by excessive inflation, its elasticity being thereby diminished. For instance, given sufficient strength in the canvas linings, a degree of hardness could be obtained by a powerful inflator, that would make the tire as hard as a board and only in the smallest degree susceptible to the pressure of the rider's weight in riding. The advantage of the pneumatic tire would thus be lost, and the inequalities of the ground severely felt. For track racing purposes, tires may obviously be pumped up harder than is desirable for road work; but the limit is often exceeded by those who do not reflect that the usual racing tire cannot resist the same pressure as one designed for use on the road. On good roads very hard tires are speedier but less comfortable than those which yield appreciably to the rider's weight. —*Sport and Play.*

THE AIR-BRAKE HOSE PROBLEM.

RAILWAY mechanics when they meet say little about the action of rubber hose in the use of the air-brake, it being the only article found practicable in the application of the principle. The trouble in chief in the air-brake at present is the triple-valve, which is apt to become clogged and impair the usefulness of the brake. The chief subject of discussion is how to devise methods which will allow brakes to be used from the locomotive in trains of one hundred cars in length. Fifty cars now make a very good train, and the air-brake works very well for that distance, but on such roads as the Lake Shore and others in the great American plateau which almost might have been said to have been especially formed for the use of railways, trains of an indefinite length will soon be operated. Heavier rails and more powerful locomotives are constantly being added, and the air brake will in its parts become a subject of discussion for long trains, and the rubber-man will soon be taxed in the improvement of hose to meet the increased pressure. While the application of the air-brake to very long trains is being discussed, it is well to state that trains on the Boston and Albany road are held in check fairly well on heavy grades by making up the train with cars equipped with the air-brake near to the locomotive. Train-hands take pains to do this to save themselves work, but it is said that there is much inconvenience and perhaps considerable expense attached to the operations of the yards in which it is done.

WANTED, A RUBBER CIGAR-SIGN.

"THE bane of my life is a wooden Indian," remarked a cigar- and tobacco-dealer. "I have had to dance attendance on one every night and morning for twelve years, with a few respites when the Indian was getting a new coat of paint, a putty nose, or some other repairs. Several times I have rebelled against my thraldrom, and left the Indian in the back room of the store, but the result has always been a falling off in business, and I have been compelled to put out and take in my Indian again. He weighs more than 200 pounds, and since I have had him I have lugged around over 1,500,000 of wooden Indian. Of course he is on wheels, but still he is not easily moved.

"I hate him, hate the sight of his swarthy face, his menacing, upraised arm, his wooden stare and stern mouth, but I am his bounden slave, and must submit. People will not patronize a tobacco-shop without an Indian. I wish somebody would get up an India-rubber savage which could be inflated in the morning and deflated at night. Leave him out all night? Never. It will not do. My rival left his out one night and it took a ride down to the Battery in a hack, and was found in the morning staring out across the bay at the statue of Liberty."—*New York Sun.*

RUBBER-RECLAIMING PATENTS IN COURT.

THE steps in the suit of the Chemical Rubber Co. *v.* Goodyear's Metallic Rubber Shoe Co. and Emmett A. Saunders, in the United States Circuit Court for the District of Connecticut, follow each other so slowly, and a decision in the case promises to be so far in the future, that it may be of interest to the rubber trade to summarize at this time the bill of complaint of the parties bringing the suit and the answer of the defendants. It may be said at the outset that the status of the suit at this time is as follows: The complainant having established a *prima facie* case by the testimony of some important witnesses, counsel for the defense have taken testimony which fills 943 printed folios. With this they rested on June 10, 1892. Since this time the complainant has been securing testimony in rebuttal, which is still in progress. As this paper goes to press the cross-examination of N. Chapman Mitchell, of the plaintiff company, is pending.

* * *

THE bill of complaint filed in September, 1888, by the Chemical Rubber Co., which is stated to be a corporation organized under the laws of the State of New York* sets forth the particulars in regard to certain patents issued by the United States government to certain individuals, each of whom is described as "the original and first inventor of a certain new and improved process of treating fibrous rubber waste," or as "the original and first inventor of a certain new and improved process for recovering rubber from rubber waste." These patents are numbered and dated as to their issue as follows:

No. 292,891, issued February 5, 1884, to Augustus O. Bourn and assigned November 23, 1887, to Augustus O. Bourn, Jr., and by him assigned February 29, 1888, to the Chemical Rubber Co.

No. 300,720, issued June 17, 1884, to N. Chapman Mitchell and assigned February 29, 1888, to the Chemical Rubber Co.

No. 249,970, issued November 22, 1881, to N. Chapman Mitchell and assigned February 29, 1888, to the Chemical Rubber Co.

No. 250,943, issued December 13, 1881, to N. Chapman Mitchell and assigned February 29, 1888, to the Chemical Rubber Co.

No. 311,135, issued January 20, 1885, to Charles J. McDermott, he having previously (December 30, 1884) assigned his interest in the invention to the New York Belting and Packing Co.

No. 262,079, issued August 1, 1882, to Charles J. McDermott, he having previously (June 20, 1882) assigned his interest in the invention to the New York Belting and Packing Co. These two latter patents were assigned February 29, 1888, to the Chemical Rubber Co.

No. 295,616, issued March 25, 1884, to Augustus O. Bourn and assigned by him November 23, 1887, to Augustus O. Bourn, Jr., and by him assigned February 29, 1888, to the Chemical Rubber Co.

In relation to the patents specified it is alleged that since the date of the issue of such patents the inventors or their assigns have had exclusive control of the invention covered by each patent and of the profits resulting from such control, and that their respective rights to the use and enjoyment of said inventions have been duly recognized and respected by the public. It is further stated in reference to each patent that the inventors and their assigns have expended large sums of money in the perfection of the processes covered by the patents, in the hope of being compensated therefor through the exclusive use and enjoyment of said processes.

It is further alleged that since January 20, 1885, the defendants in this case, meaning Goodyear's Metallic Rubber Shoe Co. and Emmett A. Saunders, have repeatedly, without the license or consent of the proprietors of the patents, used the processes sought to be protected in the works of said defendants at Naugatuck, Conn., and elsewhere in the United States. The complainant prays that the court order the defendants to show cause why they shall not answer two interrogatories, to wit: (1) Whether they have used the processes as charged in the complaint, and (2) to what extent they have used such processes, and what has been the extent of their profits from such use. Complainant further prays for an injunction restraining the plaintiffs from using these processes, and for a decree for the amount of the profits enjoyed by the plaintiffs through the infringement of the patents specified.

This bill of complaint is signed for the Chemical Rubber Co. by its treasurer, John D. Cheever, and by its solicitors, F. A. Marden, A. Pollok, and Lee & Lee.

* * *

IN their answer the defendants allege that they do not know save through the bill of complaint that the Chemical Rubber Co. is a corporation under the laws of the State of New York. They admit the issue of patents by the United States government, as alleged by the complainant, but as to the particulars of applications for the patents and the various assignments alleged they claim to have no knowledge save through the bill of complaint.

They deny, on information and belief, that the complainant is the exclusive owner of the patents or the inventions alleged to be secured thereby, and deny that the complainant was the owner either at the time of the commencement of the suit or when the defendants are alleged to have infringed these patents.

It is denied that the rights of the complainant to these inventions have been generally recognized or respected, or that any considerable quantity of waste rubber has been recovered by the processes described in the patents, or that these processes have been of great value to the public. It is denied that since January 20, 1885, the defendants have used any processes employing the inventions in question or that they have infringed the patents referred to. The next item reads:

X.—That these defendants deny that they or either of them was duly notified of any alleged infringement of said letters patent or either of them, or duly requested to desist.

Finally it is denied that the complainant will be subject to any great loss if the relief prayed for be not granted. This answer is signed by Livingston Gifford, of Gifford & Brown, counsel for the plaintiffs, and dated December 3, 1888.

An amendment to the answer of defendants under date of May 13, 1890, alleges it as their belief that the parties to the complaint, in their applications for patents, failed to file in the Patent Office a written description of the processes sought to be protected in such detail as to enable one acquainted with the state of the art to operate such processes, and further, that it was the intention of the applicants for the patents to deceive and impose upon the examiners of the Patent Office by stating less in regard to such processes than the whole truth, said applicants "*reserving the right to contend for such interpretation*

* The Chemical Rubber Co. was incorporated under the laws of the State of New York on December 19, 1887, for the "manufacture and sale of India-rubber goods and the reclaiming unvulcanized and vulcanized rubber." The capital stock authorized was $250,000, in shares of $100 each. The limit of existence of the corporation was placed at fifty years. The names of the incorporators were John H. Cheever, Augustus O. Bourn, Nathaniel C. Mitchell, John D. Cheever, and Robert J. Cummings, who were named as trustees who should manage the concerns of the company for the first year. The corporation still has a legal existence with offices in New York at No. 15 Park row.—THE EDITOR.

thereof as the exigencies of any particular case might in their judgment, or that of their assignees, require."

It is denied that either of the patentees was an inventor of the process covered by the patent issued therefor, and it is alleged that the alleged processes had been in use for more than two years in this country before the issue of the patents. It is charged that the processes covered by the various patents are distinguishable only in degree, there being no patentable distinction between them. The next specification reads:

XIX.—That prior to the inventions supposed to be patented by each of said patents respectively the process patented by each of them had been known and used in the state of the art for the purpose of destroying the fiber existing in combination with other substances than rubber, wherefore the application of said processes and each of them for the destruction of fiber in rubber was a mere double use, and not patentable.

The names and addresses are given of twenty-one persons who at various times are alleged to have used the acid method of reclaiming rubber previous to the date of any of the patents in question, including James Bennett Forsyth, Charles H. Hayward, and Thomas J. Mayall. There are also cited thirty different patents granted in the United States, Great Britain, and France, covering wholly or in part the processes to which the patents of the complainant relate. In addition, the literature of rubber-manufacture is referred to, as contained in many books and periodicals quoted by title, all of which bear upon the rubber-reclaiming process, either directly or by anticipation. The conclusion reached is:

XXIII.—That by reason of each and all of the facts above set forth the said patents and each of them are invalid and void.

The defendants assert that the several patents cannot be infringed upon conjointly, and the complainant is in error in seeking to combine in one action the alleged infringement of several patents.

There is a still later amendment to the answer of the defendants, in which it is alleged that three of the patents named in the bill of complaint,—to wit: No. 307,720, No. 292,891, and No. 311,135—were pending at the Patent Office at the same time, and in interference with each other, during which time each applicant sought to influence the Patent Office authorities in favor of his own application by urging the utter lack of value of the processes covered by the interferences. It is further alleged that patents No. 249,970 and No. 200,720 were granted for inventions previously covered by foreign patents which have lapsed through default in payment of taxes.

* * *

THE witnesses called by the plaintiff in establishing a *prima facie* case were Emmett A. Saunders, superintendent of the Goodyear's Metallic Shoe Co., several employés from the factories of that company, C. Edward Murray, and Henry L. Brevoort, an expert.

The witnesses called by the defense, after N. Chapman Mitchell, were J. C. Bickford, John A. Bowen, B. F. S. Bullard, Edward Carey, C. F. Chandler, A. W. Clapp, E. H. Clapp, Edward Dorsey, Michael Flynn, J. B. Forsyth, Ferdinand Funk, Edward Gay, Mathew Hawe, Edwin A. Hayes, C. H. Hayward, R. C. Helm, Thomas Joyce, Jeremiah Keating, Benjamin Kollberg, John M. Leonard, Michael Looby, Hugh McGrady, James Mahan, T. J. Morris, James Morrison, John Murphy, Alfred W. Parker, William Ready, E. A. Saunders, Julius Schrodelsker, A. Spadone, Hobson Swallow, and Theodore C. Weeks.

The witnesses called by the complainant in rebuttal have been J. M. Stotesbury, John H. Cheever, R. A. Loewenthal,—Gateley, of the New York Belting and Packing Co.,—Greene, of the late Beverly Rubber Co., and N. C. Mitchell, whose cross-examination is now in progress.

RUBBER GOODS FROM SOUTH AMERICA.

MANY visitors to the World's Columbian Exposition were surprised to learn that an extensive rubber-goods manufactory exists in South America, producing as great a variety of wares, perhaps, as any other concern represented at the Fair. This is the factory of S. Borok, Nos. 1352–1354 Calle Rivadavia, Buenos Ayres, Argentine Republic. The attractive exhibit made by this house in the Manufactures and Liberal Arts Building was the headquarters for the distribution of a catalogue of forty large pages, illustrated with 395 cuts of waterproof clothing and articles in hard and soft rubber, for chemical laboratories, and the use of surgeons, photographers, and pharmacists. The establishment of Senor Borok was established in 1887. The point is made that steam power is used in this establishment and that it is the first and only house of its kind in that part of the world. A study of the illustrations of waterproof goods in this catalogue is of interest as indicating that the manufacturer lives in a rainy country. Not only is there the well-known *poncho* for the use of horsemen, but there are suits especially designed for the use of sportsmen on land, including bicyclists, and also for oarsmen and others on the water. One of the most striking illustrations represents a hearse, the plumes on which have rubber envelopes, in addition to the rubber blankets for the horses and the waterproof coats for the driver, indicating that dry weather is not always insured for a long enough period for the occurrence of a funeral.

RUBBER BOOTS TESTED IN COURT.

DISPATCHES from San Francisco report the result of a suit filed in that city against the Woonsocket Rubber Co. for failure to deliver goods at a certain time to the Russian Trading Co. A verdict of $5362 damages was given in favor of the plaintiff. The defense offered by the Woonsocket Rubber Co., was that the Russian Trading Co. of Siberia could on date of sailing of the *Vladimir* have purchased 186 cases of other rubber boots, and they proved that such number of cases of boots were purchasable on that date. Plaintiff brought Eiler, the celebrated chemist, who, by tests made under the Mitchell patent process, dissolved a three-ounce piece of the Sampson rubber boot, manufactured by the Woonsocket company, and three-ounce pieces cut from other rubber boots, placing them in various vessels containing sulphuric acid, boiled them to 250° F., thereby clearly convincing the court of the different compounds and ingredients of rubber, showing that as no similar results were obtainable as existed in the Sampson boot, hence it remained impossible for the Russian Trading Co. to procure similar quality of rubber boots; therefore judgment as above stated.

GENEROSITY OF A RUBBER-MAN.

ON September 25, at Providence, R. I., Bishop Harkins laid the corner-stone of the proposed building of the St. Maria's Home for Working Girls. The building is intended to accommodate one hundred girls, irrespective of nationality or religious faith, to be under the care of the St. Maria's Working Girls' Society, recently organized by ladies of Providence and Pawtucket. Mrs. Charles O'Leary is the president and Mrs. Joseph Banigan treasurer. Mrs. Banigan made a gift to the society of a lot and building which afforded the requisite accommodations for some time. The demand for room increasing, however, Mr. Banigan, the president of the United States

Rubber Co., agreed to provide a new building at a cost of $50,000, upon the condition that a fund should be raised, the interest on which would pay the expenses of young girls unable to support themselves. This condition was fulfilled through the generosity of business men of Providence. The new edifice is to be of red brick, with stone and copper trimmings, in the French Renaissance style, and is expected to be an attractive addition to the public buildings of the city.

RUBBER GOODS SIXTY YEARS AGO.

WHO can show any advertisements of India-rubber goods for sale in the United States of earlier date than those which are shown below, copied from a file of the New York *Evening Post* for the year 1831? In those days "display" advertisements were unknown, and such cards as these were not in danger of being overlooked by newspaper readers:

INDIA RUBBER SHOES—The Feet may be preserved entirely from the wet, and kept dry and warm by wearing India Rubber Shoes—a superior lot of which is just received and for sale by WM. L. RUSHTON, Druggist, 81 William st. between Maiden lane and Liberty streets. j 13

INDIA RUBBER BOOTS & BOOTEES.—Received this day a lot of very large size, finished in a superior manner, for sale on reasonable terms by the doz or single pair, by
RUSHTON & ASPINWALL.
m 30 81 William street.

INDIA RUBBER BOOTS & SHOES.—Ladies & gentlemens India Rubber Boots and Shoes, of superior quality, for sale by the case, dozen or single pair, by RUSHTON & ASPINWALL,
n 10 Druggists, 81 William st.

DOUBLE SOLED INDIA RUBBER SHOES, a new article for sale by
RUSHTON & ASPINWALL,
d 10 No. 81 William st.

GUM ELASTIC SUSPENDERS—Just received and for sale wholesale and retail, at L. Durham's Hosiery Store, 189 Broadway, directly opposite John street. n 11

The *Evening Post* during July, 1831, contained an editorial on a new application of "caoutchouc, or India rubber," relating to its use in suspenders and other such goods, and also suggesting that the medical profession might be able to adopt the new elastic fabric to advantage.

THE POLITICAL SITUATION IN BRAZIL.

A WRITER in the New York *Sun* says: "Brazil is a republic only in name, as are the other South American republics. In reality it is an aristocracy, pure and simple. As it is but natural in a country where the mass of people are wholly ignorant, those few who have the advantage of education are absolutely masters of the political affairs of the nation, and the populace have no voice or share in the Government. Then, too, since the vast majority of Brazilians are of African or Indian descent, those who have a predominance of Caucasian blood in their veins come to the front and the race asserts itself, as it does elsewhere in the world. I doubt if there is any country in Europe, save only Russia and Turkey, where the people have not more power in governmental affairs than in Brazil; and of the other countries of South America the same story may be told.

"A revolution there is not the revolt of the people or of part of the people against the rulers, but the revolt of one faction or clique against another. There was never any popular uprising in Brazil at the time of Dom Pedro's deposition. His overthrow was accomplished by a few men in Rio de Janeiro. The people are so ignorant and indolent that a change from a monarchy to a republic was of no moment and occasioned little excitement. It will be apparent, therefore, that the time is far distant when the people of Brazil will 'assert their right to rule.' In fact it would seem that the people of the African and Indian races who compose so large a proportion of Brazilian population can never assert a right to rule over Caucasians."

THE LATE SIMON M. RUNYON.

REFERRING to Mr. Simon Runyon, whose death in San Francisco was announced in the last INDIA RUBBER WORLD, the Orange (N. J.) *Chronicle* says: "Mr. Runyon removed with his family from East Orange to San Francisco, Cal., fifteen years ago, where he engaged in business as one of the firm of Pease & Runyon, agents of the Goodyear Rubber Co., of New York. Some time ago the San Francisco agents determined to establish a branch house in Portland, Ore., in charge of Mr. Runyon, who was completing arrangements to go to Portland, when he was stricken with typhoid fever, and died after a brief illness. Mr. Runyon leaves a widow and a family of eight children, one of whom, Mrs. Edward M. Colie, is a resident of Prospect street. Mr. Runyon was one of the founders of the First Congregational church and a trustee until his removal from East Orange, and was actively identified with all the earlier improvements in this township."

A SUBSTITUTE FOR RUBBER SOLES.

THE Lewiston (Me.) *Journal* says that J. T. Brown, who has charge of the Champion nailing-machines in the different shoe factories, and whose headquarters are at the Elm House in Auburn, appears to have a very good thing for substituting leather soles for rubber soles in the manufacture of bicycle-shoes, which has come to be an important department in the shoe business, ranking with the baseball-shoe and the tennis-shoe. There is said to be some objection to the rubber-sole bicycle-shoe, and Mr. Brown believes his invention will meet it. If the leather sole can be made as flexible, as durable and as good in other respects, it would look as though Mr. Brown might stand a chance of making a dollar. It is understood that he intends to place his machines in the shoe-factories, making bicycle-shoes, on the royalty system. He expects to have the machine perfected soon. John Crawshaw, the Auburn machinist, is getting out the models.

THE MARKET FOR CHICLE.

THE Seeger & Guernsey Co. (No. 7 Bowling Green, New York city) favor THE INDIA RUBBER WORLD with the following report in regard to the market for Chicle:

"We beg to inform you that owing to the small demand from the manufacturers, the price for Chicle declined during September to 22 cents per pound, but has since recovered to 24@25 cents, at which holders are firm. The arrivals have not been of any consequence lately, and they will probably not reach any importance in the near future. Judging from our advices from Mexico we hope to see prices continue firm, and may be with a higher tendency."

PRESIDENT PEIXOTO has sent a message to the Brazilian Chamber of Deputies asking for a special appropriation of 1,300,000 milreis for the telegraph line between Pará and Manáos.

WATERPROOF LEATHER VS. RUBBER.

THE threat has been made that if the prices for rubber foot-rubberwear continue high, leather will be worn instead and rubber goods boycotted. To this is added the information that a new process has been discovered and patented by which leather can be cheaply and permanently waterproofed, and thus in every way be as good as rubber. There is no doubt that the last statement is true, at least in part. Leather can be made waterproof in a score of different ways. When, however, it is made as impervious to water as rubber is, it becomes a most disagreeable wearing material. A pair of absolutely waterproof leather boots on a hot day are far more uncomfortable than a pair of rubber boots. The fact is, leather is the natural dry-weather foot protection, and rubber the wet-weather protector. One cannot successfully take the place of the other and this has been proved by hundreds of experiments and scores of inventors.

FROM A DRUMMER'S NOTE-BOOK.

THERE have been many complaints from the trade about the size of the mackintosh boxes. The great trouble has been that after a coat has been taken out of a box the average salesman can never get it back again, as it is quite a job to fold some of the mackintoshes now on the market, correctly. Especially is this the case with the sleeveless or all-round cape Inverness.

—Detailed orders of boots and shoes are being given by the retailers in a careful manner, and the orders are running smaller than heretofore. The shoe salesmen from the jobbing and rubber houses are having hard work to get details, as many retailers refuse to buy and say they will not do so until the goods are wanted, which is liable to be the same old story—when they want them there will be trouble in getting them in time. Many of the largest jobbers are making no special effort to secure orders for shoes early, as they are opposed to the former system of shipping goods out and taking the chances with such an extended time of credit.

—The latest fad in the rubber business is known as the Mackintosh Club. Some individual who is clever and persuasive secures the names and willingness of fifty gentlemen to buy mackintoshes on the installment plan. Each one of these subscribers is to pay in say $1 per week, and at the end of every week a drawing takes place by which the fortunate man gets his mackintosh without any more future payments. Each subscriber has a number and small balls bearing the numbers of each are put in a bag; one being taken out weekly and of course the holder of the number gets his coat at once. This drawing is kept up until the last coat has been delivered and naturally this system creates more or less excitement from the chance it gives for securing a coat at a small cost. It is reported that in some sections these clubs have taken a great many coats, but the plan will hardly be a success all over the country, as some States look upon the system as being too near a lottery. Few people however, have any idea how many mackintoshes, especially ladies' goods, are sold on the installment plan. Several men in New England make a regular business of selling to the consumer and collecting weekly part payments for the garments.

—There are rumors in the air of a new company being formed for the manufacture of a certain rubber boot, said to possess many points of advantage over any boot on the market.

—Since the advent of the new style of rubber tires for bicycles certain mills are giving a very large part of their attention to their manufacture. Improvements are being constantly made and the rubber tire is gaining a foothold in the carriage trade. In Europe these tires are used very largely on the better class of carriages and they give excellent satisfaction, but the paving of the streets in European cities is vastly superior to ours, and the tires naturally last much longer than they would with us.

—The Boston Rubber Co. have gotten up a very handsome and artistic list of their specialties in "Bell brand" shoes. All the specialties of the company are photographed and the blending of several inks in different colors gives a very pretty effect. The catalogues and price-lists of all the shoe companies this year are much handsomer than ever before—most of them being really works of art, from the standpoint of the lithographer and printer.

PIGMENTS USED IN SOME INDIA-RUBBER TOYS.

INDIA-RUBBER has been generally, and correctly, accepted as a suitable material for children's toys; but investigation into the manufacture of the latter reveals the fact that many as placed upon the market contain harmful ingredients. A. Bulowsky has recently called attention to several dangerous ingredients as, for instance, in black dolls, which are often colored "in the mass" with lead pigments. Red articles are also most usually colored in mass, the pigment being antimony sulphid, which, however, being unattacked by the saliva may be considered innocuous. Grey rubber goods generally contain zinc oxid, and hence particularly when as is sure to be the case, the toy is brought to the child's mouth, an element of danger is introduced. Superficial coloring is frequently accomplished by means of poisonous pigments. These remarks are applied in particular to foreign manufactures, and though, doubtless, the same coloring matters are used in this country, I have yet to learn of a case of poisoning from coloring in mass. Superficial pigments, from their disposition to flake and from the greater quantity brought into contact with the mouth, are certainly to be avoided. It is difficult, moreover, to estimate the amount of damage done by these toys owing to the many petty ills and derangements of infancy; the poison received by the child very likely is insufficient to develop well-defined symptoms or to direct suspicion, but at the same time may be the cause of an indisposition which itself brings on crying, wakefulness, and general wear on the little body struggling for existence.—*Dr. Charles Platt, in Science.*

ADVANTAGES OF RUBBER BELTING.

RUBBER belting has been on the market in its many forms for some thirty years. At first it was not properly made, the cotton was not stretched and the rubber not rightly compounded, so that the makers had much to contend with in introducing their goods. The user did not know how to use the mill belting, allowing it to get covered with grease and oil, which, while not as quick in their action, affect the rubber much the same as naphtha, the result being that many good belts were ruined, the fault being generally charged to the manufacturer.

After a time they degan to gain in favor, first in one trade, then another, until now they are found in almost every factory.

The paper manufacturers have found them to do good work, as they will stand the moisture for a long period before becoming unfit for use. The grain elevators, sugar mills and flour

mills use the wide rubber belts for conveyors, superseding the bucket conveyors to a large extent.

Another use that is found for rubber belts is on the threshing-machine. They are made in lengths that the different machines require, the ends are joined together at the factory, making the belts endless and of a uniform thickness. They give great satisfaction to the users.

Rubber belts, like those of leather require good care to get best results and long life. Pulleys must be in line, the belt not allowed to strike in its travel, for if the edge gets worn so that one ply of the cotton is cut through the belt will soon go to pieces.

Rubber belts can be spliced at the factory to make an endless belt, but no satisfactory way has been found to splice them at the place where they are to be used, no cement having been produced that will hold. Hooks give good results. The wide clasps with many teeth give satisfaction, as they do not require large holes and consequently do not weaken the belt.

Oil should not be allowed to get on the belt. It should, if used where it is damp, be wiped at intervals so as to be kept as dry as possible. There have been many different schemes devised to weave wire into the edges of the rubbber belt to keep the edges from being worn; as yet they have not been a marked success. For many purposes the rubber belt meets the requirements admirably.—*Boston Advertiser.*

FIBROUS TALC IN ONTARIO.

THE following from the Brockville *Recorder* will be of interest to the talc-manufacturers: Application has been made for letters patent for "the Talc Fiber Co. of Frontenac and Hastings," with a capital of $150,000. The company will work talc deposits in Eastern Ontario, having secured over two thousand acres of these deposits. They are convinced that Canadian talc is equal in fiber, softness and floating qualities to any found in the United States, from which country talc used in the manufacture of paper and in rubber compounding is imported. Arrangements have been completed for the erection of a mill in Kingston, at which the finished product will be turned out.

WORLD'S FAIR NOTES.

AN excellent exhibit in the Shoe and Leather Trades building is that of the house of Carl Schwanitz, of Berlin. It embraces rubber carriage-tires, rubber belting with hardened edges, and a great variety of hard-rubber goods. It is one of the best displays of mechanical rubber at the Fair.

—In the German department, Machinery Hall, is to be found the exhibit of Louis Wertheim, the celebrated manufacturer of asbestos goods at Frankfort o/M. This embodies engine-packings of all descriptions, asbestos and rubber combined, asbestos millboard and paper, asbestos canvas, and firemen's goods. This excellent display is under the personal supervision of Mr. Ed. Wertheim.

—In the Horticulture building is exhibited the Traveling lawn-sprinkler, manufactured by a Portland (Me.) concern and sold throughout the country by a Boston house. It is attracting a great deal of attention.

—The Tannette Manufacturing Co. (New York) have an exceedingly handsome case where is shown a substitute for leather, presumably of a rubber compound made up in a variety of handsome colors and very effectively displayed.

—One of the exhibits on the Midway Plaisance is a man in complete diving armor, who disports himself in a huge glass tank under water. His armor is made partly by Alfred Hale, of Boston, and partly by Schrader, of New York.

—Those who are interested in mining machinery examine with great care the three great "Improved Frue, Vanner Plain, and Morse Belts." They are each conveying belts of rubber of which more than 4000 are in use to day in mining plants. There is no name on the belts to show who manufactured them, but whatever company secured the contract certainly did themselves credit, for the work is beautifully done.

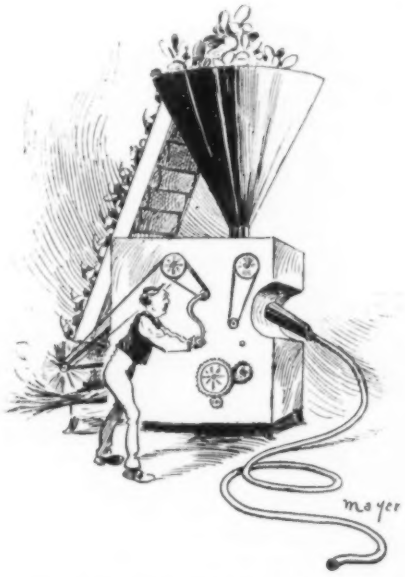
—Adam Opel, bicycle- and sewing-machine manufacturer at Ruesselsheim, near Frankfort o/M, exhibits twenty-three wheels with pneumatic tires. The house was founded in 1862 and the yearly production is now stated at 9000 bicycles and 25,000 sewing-machines. A United States agency is wanted by this firm.

—There are two fine India-rubber trees in Horticultural Hall each ten feet high, sent from the White House conservatory at Washington.

—In the fisheries exhibit of the Smithsonian Institution, in the Government Building, are a number of articles to which oysters have attached themselves while in the ocean. Among these are a child's leather shoe almost covered with the young bivalves, and a large rubber boot with fifteen good sized mollusks appended to it.

—Anderson, Anderson & Anderson, of St. Paul's Churchyard, London, exhibit rubber clothing and a large assortment of rubber boots in the great Manufactures building.

THEORISTS are not always practical. A late writer in a paper dear to our hearts talks about stirring aniline dissolved in benzine in hot melted rubber! What would the benzine be doing while he was so engaged? Then if the benzine did not for once do its duty in its peculiar way, would that melted rubber ever become elastic? It would be a nondescript, of no use to any one.



A MODERN TIRE-MAKING MACHINE.

[The rubber leaves are fed into the hopper and the pneumatic tires issue from the spout.]—*From "The Referee" (Chicago).*

INDIA-RUBBER SCRAP.

THE vulcanization of rubber was a step forward in the efficacy of piston-rod packings. It was gradually utilized to overcome the objections of rigid bearing consequent upon the tendency of the fibers previously in use to carbonize and become rigid in steam, and it was more readily adjusted to service. There was increased elasticity as well as durability of the materials cushioned, and an endless variety followed, each successor being full of merit and better results. The chief fault of the times is the ever present yielding incentive to force cheap goods into the hands of the steam-user.

* * *

AN air thermometer, recently invented in England, for giving warning of fire, embodies a thin hollow India-rubber diaphragm as a principal feature. The increased heat expands the air in a box attached to the ceiling, this raises the diaphragm, and in turn a rod simply large enough to cause it to come in contact with a terminal, closing an electrical circuit. The India-rubber pulsator naturally must be local, but the indicators can be at any distance. It has been found that rubber is the best material to respond to the expansion of air, as in the bicycle, and so it has been chosen.

* * *

IN Germany each rubber-factory has a staff of chemists, numbering as often as six persons. Mixing is brought down to 12½ per cent. of rubber, where 50 per cent. would be used in this country, quality for quality.

* * *

A NEW rubber for book-binders is put up in pieces weighing one-eighth of a pound and is formed expressly for the purpose of catching the waste gold leaf in the gilding of book edges and covers, the surplus being rubbed off and in a measure adhering o the device.

* * *

ELECTROTYPERS also use an eraser composed of a block of wood gripping a piece of rubber. The workman, by passing this eraser, a misnomer perhaps, over a plate can readily distinguish unevenness, as the rubber will polish the high portions, while the depression will remain of a dull color.

* * *

THERE is no sweet without a little bitter lurking in the neighborhood. Careless pedestrians in London complain that hansom cabs equipped with pneumatic tires do not give out the usual warning noise of the iron tire, and are consequently dangerous to life and limb.

* * *

CUT-SHEET rubber is used largely all over the world. The best Bolivian gum is selected and massed upon a mixing-mill and then put into a rectangular iron box and pressed into a solid cake. In this box is a traveling platform which slowly feeds the cake against a small revolving knife, by which it is cut into exceedingly thin sheets which are used for surgical operations, balloons, tobacco-pouches, etc. The making of a balloon, or a perfect sphere, is a matter of some skill. Only an odd number of pieces are used,—say nine, eleven, thirteen or fifteen, as an even number would not form a perfect sphere. Some goods made from cut sheet are not subjected to vulcanization. India-rubber thread was formerly made in the same manner as cut sheet, and its manipulation was wonderful, as it takes 8000 yards to make a pound. In the Jacquard looms as many as three thousand of these threads were used.

IN the making of rubber cement, the finest, light st, and cleanest are made of selected parts of Pará hams. The outer skin is discarded and the inner part is carefully stripped and minutely separated when it is soaked in benzine which softens it and quadruples its bulk. A little resin is added and the whole churned for hours when the mass becomes ready for the market, The cobbler adds a little lamp black to the solution and some litharge which causes it to dry quickly. A queer idea that the shoemaker has is that all this is a close secret of the trade, and he will not therefore tell the outsider of it. Sitting in his little basement room hardly large enough to hold himself, he works contentedly with his secret, something after the nature of the ostrich who buries his head in the sand to escape the observation of the hunter. The photographer uses a cement very much thinned by the addition of more solvent.

* * *

IN the fifteen colors used in the arts and described as the most dangerous to health, and which some rubber-men use, are orpiment, bromide of mercury, litharge, prussian blue and prussian green. Among colors less dangerous are vermillion. purple red, oxid of zinc, chromate of barium, and ultramarine. Among those not dangerous are sulphate of barium, yellow and red ochres, venetian red, cochineal, manganese brown, raw and burnt umber, indigo, and colcothar.

* * *

IN reclaiming rubber the manipulation by heat is being considered, the chief drawback being that such means will not remove the dirt, the first step in reclaiming rubber.

* * *

JUDGE—There is overwhelming evidence here that you deliberately stole a door-mat and afterward tried to dispose of it. What have you to say for yourself?

Prisoner—I didn't steal nothin', Yer Honor. I was walkin' kinder slow like past a house and seen that there mat with some kind of writin' on it. I spelled out "welcome." So I jus' picked up the thing and took it with me.—*Detroit Free Press.*

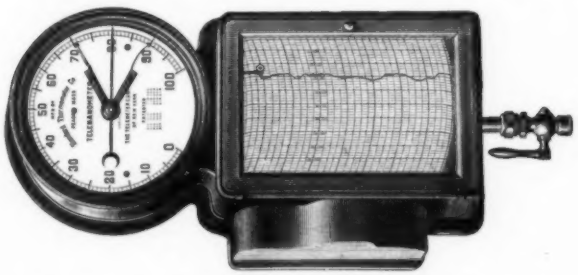
A BICYCLE HAT FOR ENTHUSIASTIC WHEELWOMEN.
—*From the "Referee" (Chicago).*

NEW GOODS AND SPECIALTIES.

ACCORDING to ancient history Milo the Cretan was one of the strongest men that ever lived. His specialty seemed to be carrying heavy loads; he, for instance, picked up a live ox, threw it upon his shoulders, and ran a mile with it. A New England rubber-manufacturer who has a new belting that is singularly strong as a carrier, feels that it deserves the name of Milo belting and has had designed the very effective trade-mark here shown. The special points about the Milo belting are in the first place that it is an exceeding strong stitched cotton belting. It is sewed with rows of stitching throughout its entire length and therefore cannot possibly separate. Oil in any quantity cannot injure it in the least. It is thoroughly waterproof, is not affected by heat, cold, steam, dampness; nor will any gases in any way injure it. Careful tests prove that no matter what conditions it may pass through it always remains soft and pliable. There is no doubt but that stitched cotton belting is cheaper and more durable and far stronger than leather belting, and as manufacturers find this out it is being rapidly adopted. The Milo belting is made entirely of one piece which is an effectual guard against any fraying of the edges. By a special process it is thoroughly stretched before leaving the factory. Price-lists of the belting mailed on application. Manufactured by the Boston Woven Hose and Rubber Co., Boston.

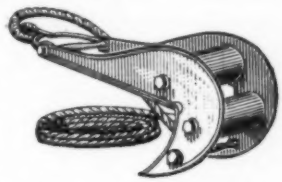
IT WATCHES THE HEATER MAN.

A NEW appliance that is already in use in large vulcanizers in many rubber mills and bids fair to be generally adopted by the trade is shown in the accompanying illustration. It is a gage which accurately registers the steam pressure during the entire length of the heat and gives the record so plainly that it is impossible to misunderstand it. It is an exceedingly simple mechanical device. The pressure spring in it is not in any way hampered as in other devices by a recording pen at the end of a long arm, as that is found to be a drag on the spring. It is fitted with a six-inch dial like that on any steam gage, and has the largest record sheet ever introduced. It has a daily time record twenty-four inches long, and a pressure record five inches wide, and revolves at the rate of one inch an hour, showing ten inches of the sheet, or the previous ten hours run, clearly. Each sheet has the time and divisions clearly lined and numbered so they can be easily read several yards away. The sheets are easily changed and may be conveniently filed away and bound in a book six inches by twelve. The clocks run eight days, are easily regulated and wound. As so much depends on the capability of the heater man, a gage of this kind is almost a necessity for accurate work. Manufactured by the Standard Thermometer Co., Peabody, Mass.



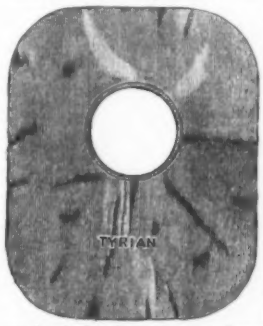
BRESNAN'S HOSE-HOIST.

VARIOUS arrangements have been patented from time to time to assist firemen in handling hose, not only when it is on the ground, but on ladders or over steep roofs. A simple arrangement that almost all the "fire laddies" approve of, and that is in wide use, is what is known as the Bresnan Hose-Hoist. It is so simple that it needs no description, the cut showing exactly what it is and for what it is to be used. Manufactured by the United States Hose Hoist Co., New York city.



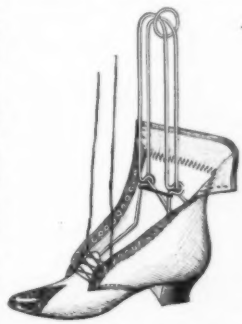
A RUBBER BARBER'S BIB.

THOUSANDS of barbers the country over will certainly appreciate the novelty shown in the accompanying illustration. It is in brief a bib of pure rubber so elastic that it could be stretched over a barrel, if necessary. It is provided with a circular opening bound with a pure gum hem to prevent tearing. In use it is easily stretched over the head and embraces the neck closely, keeping water from coming in contact with collar or shirt during shampooing. It is convenient, easily applied and far from costly. There has been a call for just such an article, and we look for it to have a large sale. Manufactured by the Tyer Rubber Co., Andover, Mass.



WHITCHER'S RUBBER-SHOE HOLDER.

IT often happens that a lady or gentleman wishing to clean a soiled rubber shoe finds it an exceedingly disagreeable task. However carefully the rubber may be held, the hands get more or less soiled. To overcome this a patent adjustable shoe- and rubber-holder has been brought out. The illustration shows it placed in a leather shoe, the handle projecting from the shoe in such a manner that it can be easily grasped and the shoe turned in any position without the hands touching it. It is used in exactly the same manner when the rubber is to be cleansed. This article is already taking with the general trade and has been used in some instances as a novelty for placing in show windows. Manufactured by Frank W. Whitcher & Co., No. 4 High street, Boston.



RUBBER SOAP.

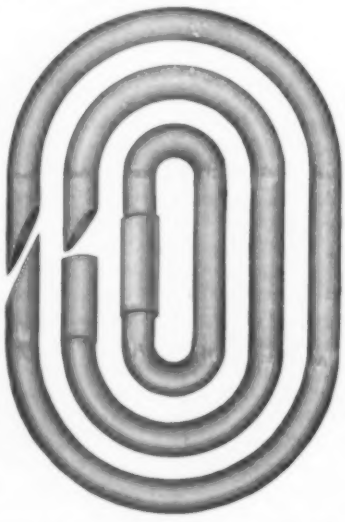
THE remarkable success that has attended the sale of Bailey's rubber bath-brushes is known almost everywhere. In connection with this has come a demand for a fine toilet soap that shall be especially adapted for use with the brush, and after considerable experimenting Mr. Bailey has brought out what is proving to be a very perfect toilet soap. It is a singularly pure compound and the trade in general take to it immediately. A feature about the soap is the neatness and beauty of the packages in which it is packed for shipment. Manufactured by C. J. Bailey & Co., No. 22 Boylston street, Boston.

THE "LORD LOUNSBURY" MACKINTOSH.

THE fashionable overcoat for gentlemen this winter will have what is known as a full back. In like manner the mackintosh will conform to this latest demand of fashion. The mackintosh shown in the cut is the latest thing in this style. It will be noticed that the back is made of one piece instead of having a seam down the middle as formerly. The skirt of the coat has two splits, one on either side, the pockets are straight, or in the ultra fashionable coat crescent shaped and taken all in all it is a very "sporty" garment, especially when made up in light-colors. The goods are of the well known Mandelberg make, and are advertised by E. E. Leech, No. 47 Boylston street, Boston.

A NEW GASKET PACKING.

THE "One-Size Lightning" Patent Gasket Packing is a new invention of a New York rubber-man. It consists of a solid cord, ⅛ inch in diameter, with sleeve joints to fit. The points made by the manufacturer are that there is no possibility of air getting inside to blister when heated, that no metal joint requiring extra pressure is used, and that there is no tape-wrapping at the joint preventing equal expansion under heat of pressure. In other words that the "One-Size Lightning" when applied has a nearly uniform flange, or rather a little wider, perhaps, where the sleeve-joint covers the overlapping ends. Under pressure the flange, if it be ⅛ inch in thickness, grows to ¼ inch; if 1-16 it grows to 1½. This packing is put up unvulcanized and can easily be built to any required thickness, or it can be reduced to as narrow a flange as desired for stretching after it is made into a gasket or ring. It is self-vulcanizing, and the sleeve-joint is exactly of the same material as the solid cord of the body of the gasket, and under heat it vulcanizes into one solid piece. If the joint is packed with a built-up gasket,—that is, if two or more gaskets are put together, the result is one solid piece throughout. Another point in favor of the gasket, which relates more particularly to the compound of which it is made, is that it never becomes thoroughly hard, always retaining sufficient elasticity to make it a perfect packing. It can be used on cold as well as on steam joints, and it makes a gasket to fit any size of hand-hole, man-hole, union-, or flange-joint. The illustrations show different sizes and shapes of gaskets. The gasket is manufactured by the Metropolitan Rubber Co., No. 676 Broadway, New York.

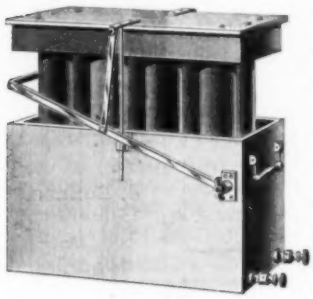


A NEW COMPOUND FOR BATTERY-CELLS.

FOR a number of years past rubber-manufacturers have been trying to get a compound for cells for primary batteries that would not only withstand acid but would withstand it under electrical action. Time after time it was asserted and believed that this compound had been secured but only to be proved an error. The compound, for example, would stand the acid perfectly and the electrical action without the least leakage, but let the cell once be emptied and the air get at it for ever so short a time, when next it was filled the chemicals would cut through it as if it were brown paper. Thousands of dollars were spent in experimenting and still the problem seemed as far from solution as ever. A Boston inventor, however, began a line of experiments that resulted finally in success. The compounds that he used are kept absolutely secret. Indeed, although the cells have been in use for several years as a matter of the most careful test, very few people know much about them. As the compound in part is a rubber compound, it is proper that THE INDIA RUBBER WORLD should be the first to exploit this invention. The cuts appended show different forms of the cells, but of course give no indication of what the compound is. All we can say is that the results prove conclusively that a cell has finally been produced that is light, strong, and absolutely acid proof. Using the cell already described, the Hubbell battery has already proved itself a pronounced success. The smaller illustration here shown (Type "A") is a hand lamp, which is simply a four-cell battery, 4½x4½x6 inches, weighing only four pounds. This produces a three-candle-power light, burns for ten hours, and costs only two

TYPE "A."

cents. It is easily charged and refilled, the operation taking only two minutes. This is an extremely practical invention, as it is compact and portable, there is no slopping of the chemicals, and as it has very high electromotive force,—1. 28-30 per cell. It has great constancy and absolute freedom from polarization, low initial resistance, absolute freedom from noxious fumes and deposits, and unquestioned safety. Special features of it are: a device for cutting off the current by means of insulating-shields, which, when pushed down, separate the fluids and permit no percolation through the porous cup, thus keeping the battery effective for an indefinite period: an oxydizing pad which telescopes into the battery absorbing and oxydizing all fumes: a method of making contacts through the bottom, allowing it to be portable when closed: a device for making central contact with zinc element by means of an insulated electrode which results in greater electric energy from a given surface of zinc, *i. e.*, one ampere of current for each one and one-half inch of zinc exposed. The battery has been tested by Robert S. Lozier, chief inspector of the General Electric Co., who speaks very highly of it. Lieut. G. A. Whistler, U. S. A., a Government expert, tested it very carefully and is enthusiastic in its praise. He says "that there should be no polarization is simply incomprehensible," and further, "for lighting railroad-cars, mine-lamps, magazine-lanterns, running light lathes, sewing-machines, dental engines, etc., I do not think it has an equal." His tests for its use for firing guns were perfect. He also recommends it for military telegraphy. In addition to this the battery might be used for shop lights, for medical and surgical uses, ship lights, watchman's lanterns, stable lights, for laboratory purposes, propelling pleasure boats, horse-clipping machines, etc. It is also recommended for use in mines, and the rubber trade may find it of advantage in cement-rooms or places where naphtha fumes are prevalent. There are five sizes of these batteries made. The largest type, "E," has eight cells, is 14x7x9 inches in dimension, weighs thirty pounds, gives a ten-candle-power, and the light burns ten hours. It will be understood that this battery can be used either for lighting or power purposes, and is the cheapest and most constant portable lighting or power plant that can be produced. For further information those interested should address the Newton Rubber Works, Newton, Mass.



TYPE "H."

A NEW INSULATING PAINT.

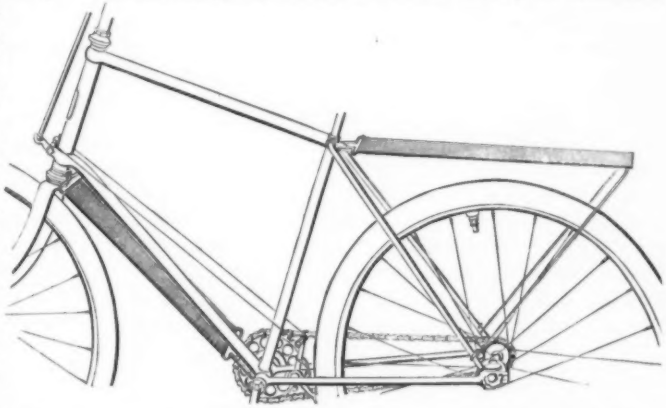
A NEW insulating paint that has won many friends in the last few months and is bound to have an exceedingly large sale is what is know as Enamelac. It is used primarily on iron work, in place of japan and has a high degree of preservative qualities. It is absolutely waterproof and it is so rapid drying that it is hard one hour after application. It is thoroughly acid and alkaline proof, has no offensive smell, and is possessed of great durability. For boiler-fronts it is especially good, gives great beauty of finish, and for an effective prevention of rust and corrosion by acids, etc., it easily stands at the head. For a great variety of work where insulation is desired it has been found to be exceedingly effective. It is one of the inventions of the Massachusetts Chemical Co., and is placed on the market by C. S. Knowles, No. 7 Arch street, Boston.

EMPIRE CASKET ENVELOPE.

A SPECIALTY that is having a large sale among the undertaking fraternity is what is known as the Empire Casket Envelope. It is a neatly finished rubber envelope which is used for covering caskets while in the ware-rooms to protect them from dust or in packing to keep out dampness or dirt. It is also used as a rain protector where caskets are exposed to the weather. They are made in different colors of rubber and of different fabrics. The popular styles are an envelope with a slate-colored rubber compound on the outside, a plaid cambric with rubber inside, cashmere with rubber inside, and black and white check with the rubber inside. They are made in four sizes and are having quite an extensive sale. Manufactured by the Empire Rubber Co., No. 335 Broadway, New York.

VICTOR RUBBER MUD-GUARDS.

THE best metal mud-guards yet devised for bicycles have left something to be desired on the score of both lightness and neatness. The fact has led to the invention of a mud-guard of rubber, the appearance of which is indicated by the accompanying illustration. There is little to add in the way of description, since the cut plainly shows for itself. It may be mentioned, however, that the rubber is elastic, and that upon this tension the device is readily attached to the wheel or removed from it. The price per pair is stated at $2. It is placed upon the market by the manufacturers of the Victor bicycle, the Overman Wheel Co., Chicopee Falls, Mass.



MINOR MENTION.

ANOTHER new car-fender in which rubber is used has been brought out by Joseph J. Beals, of Boston. It is composed of a flexible steel netting, the meshes of which are so arranged that when a strain is put on them the netting yields in all directions. The fender is so close to the ground that a body coming in contact with it cannot go under the car, but falls on the netting, which sags and receives it in safety. The meshes, being flexible, enable the grasping of any portion, no matter where the hand may fall. The nose of the fender is covered with rubber and its whole length is supported and run upon wooden balls which revolve and act as wheels when necessary.

—The American Leather Waterproofing Co. have a preparation for making leather so impervious to water that their friends claim that it will drive the rubber boot and shoe out of the market.

MINISTER ROMERO ON RUBBER-PLANTING.

RUBBER-TREE planting is a subject which long has interested the Mexican minister to the United States. Readers of THE INDIA RUBBER WORLD will recall his contributions to this journal on this subject in the past. Recently the editor received a letter from Senor Romero in relation to the paper on "Rubber-Planting on the Isthmus of Tehuantepec," by Mr. F. O. Harriman, published August 15. This was written without any idea of taking issue publicly with Mr. Harriman, and not expecting that the letter would appear in print. But at the suggestion of the editor he has consented to its publication, as the further discussion of the subject may do good. The letter follows:

TO THE EDITOR OF THE INDIA RUBBER WORLD: I read with a great deal of interest in a recent number of your journal Mr. F. O. Harriman's article on "Rubber Planting on the Isthmus of Tehuantepec," and I am glad to see that he is so much pleased with his location at Jaltipan. While I think that Jaltipan is a very good location for rubber planting, and with but one exception agree with everything he says in this regard, I am afraid that he is mistaken in considering that coffee and rubber can grow well on the same ground, or rather, that low hot lands are the best for coffee. In my opinion there is no land hot enough for India-rubber or, rather, the hotter the temperature the better it is, provided, of course, that it is moist or damp. But not so with coffee, which, in my opinion requires a temperate climate, where it will not freeze. The mere fact that coffee-trees cannot grow at Jaltipan without shade, shows in my judgment that that zone is not the proper one for coffee-growing, since it requires an artificial reduction of temperature. You can grow pineapples in St. Petersburg, Russia, but only in a hot house,—that is, by increasing artificially the temperature,—the only difference being that in one case you increase and in the other reduce the temperature. For commercial purposes it will not do to change the conditions of nature, as the cost of production will be very much increased when you have to use artificial means to alter the climatic conditions of a place. I have had a great deal of personal experience in coffee-planting, and I am sure that I am right in this view of it, and, if necessary, could demonstrate it very clearly.

If Mr. Harriman's estimate about the yield per coffee-tree in Jaltipan is correct, the place must be exceptionally good for coffee raising. The yield per tree depends mainly on the zone the trees are planted in. When they are planted in the hot zone, the medium yield is from 4 to 8 ounces per tree and when in the temperate zone about one pound per tree. Isolated trees planted near houses where they have better care and manure may be found yielding in the hot zone even 8 pounds, but they are exceptional cases, and could not be taken as a basis for the yield of a large plantation. One pound per tree is a very good yield, as an average. The expenses of keeping the plantation and gathering the crop are also smaller in the temperate than in the hot zone.

I do not agree with Mr. Harriman in his assertion that the India-rubber trees require shade while young. If he takes from the woods small plants which have grown in the shade, and transplants them on cleared ground, it is likely that they will not stand the heat, especially as they suffer a great deal from transplantation, even when that operation is done under the best circumstances. But if he sows the seeds in a nursery without shade and they spring out without shade, he will find that they come stronger and stouter, and if he then transplants them to their final location, he will see that they do not need any shade at all, and that the young plants grow more rapidly and stronger without shade. Very truly yours,

M. ROMERO.

Mexican Legation, Washington, D. C., September 25, 1893.

A PROSPECTIVE PATENT SUIT.

A PROMINENT rubber concern is about to be sued for royalties due the patentee of a rubber-lined boot. In this suit damages are claimed, not only for the boots manufactured with a rubber lining, but as well for those with the fusion lining which, it is claimed, is an infringement of the same patent. Granting that the rubber-lined patent is a good one, and can be sustained, which some doubt, it is worth one's while to examine its claims to see if they cover frictioned cloth. Patent No. 216,269, dated June 10, 1879, granted to Frank E. Hall, of Portland, Me., contains everything in the way of claims that bear upon this matter.

The object of the invention, it is stated, is in part to "render them [the boots] capable of repeated cleansing." This would in a measure fit the fusion-lined boot, but not to the same degree as the rubber-lined. The invention covers a "rubber boot or shoe provided with a distinct inner lining of vulcanized-rubber compound and having *between* said lining and the outer coating of rubber an *interposed* sheet of cloth or other fibrous material." Certainly this does not describe a fusion lining thus far, but on the contrary pictures a smooth inner surface of rubber with the frictioned cloth between it and the outer coating of rubber. Speaking of the ordinary boot or shoe with a woolen or textile lining, the document says: "With such construction the textile lining speedily becomes soiled and . . . . . becomes so permeated with foul odors and perspiration from the feet as to be very offensive and positively injurious to the health. No cleansing can remove the filth so incorporated with the fiber of the lining."

To a close observer these defects apply to the fusion lining in a measure as well as to a textile lining, for every fiber that comes to the surface can and does absorb perspiration and foul odors, nor can any washing or cleansing remove them. Further on the patent reads: "The lining is made of rubber compound . . . . which is entirely non absorbent of odors, *impervious to moisture*, and may be readily and repeatedly washed or scrubbed out, and quickly dried."

No one will for a moment claim that frictioned cloth is "impervious to moisture," nor is it possible, when once the fiber is full of moisture, to dry it easily. On the contrary, it holds the moisture and often rots the goods. Thousands of feet of garden-hose are spoiled yearly simply because the outer cover of rubber wears through exposing the frictioned cloth to moisture which is taken up by the fiber, even though they be bedded in rubber and covered by rubber, and by capillary attraction the moisture will travel from one end of the hose to the other and cannot be removed.

In describing the boot by the drawing that accompanies the patent the inventor speaks of the inner coating of rubber in the same terms as the outer coating of rubber; if therefore he meant a fusion lining when he talked of rubber lining, why did he not also mean a fusion outer coating? Speaking further of the friction part of the boot he says: "This textile lining serves to stiffen the stock since the rubber from the sheets *each side of it* unites through its meshes and adds to the strength of the material far more than an equal thickness of rubber would do." If the patent carries a fusion lining, what is that fusion lining doing with a coating of rubber each side of it? Further on, in describing in part the making up of the boot, it is said: "I usually cut both outer coating and lining from stock having such *fibrous backing* [not from fibrous cloth alone it seems], thus bringing two textile sheets together." Further on he speaks of both lining and outer coating of the boot as having an "impervious wall." Again, when discussing the cure of the boot, he says: "May be vulcanized by steam heat, since the steam does not penetrate the rubber lining." Who will claim that steam cannot penetrate frictional cloth?

In the two claims which summarize the patent the inventor distinctly says the textile material, *i. e.*, the friction cloth, is interposed between the lining and the center body of rubber. In fact, the whole patent shows that the thought of the inventor was of a smooth non-fibrous rubber lining, and that the wish to include fusion-lined goods was an afterthought.

NEW PUBLICATIONS.

THE ANNUAL STATISTICS OF MANUFACTURES [OF MASSACHUsetts.] 1892. Boston: Wright & Potter Printing Co. 1893. [Cloth. 8vo. 475 p.]

THIS is the seventh annual volume in a series of Massachusetts State reports designed to show existing industrial conditions, to exhibit the trend of industrial progress, and to note industrial decline if it occurs. This report is not by any means to be regarded as a census report, presenting numerical aggregates for all the industries in the State. But by a comparison, one year with another, of full reports relating to the leading establishments in seventy-five classified industries, a fair idea is obtained of the progress or decline in industrial matters. The statistical methods inaugurated in Massachusetts by Carroll D. Wright, so ably supplemented by his successor, Horace G. Wadlin, have compelled the favorable recognition of the world. So when we take up this volume and find a favorable showing for Massachusetts manufactures for 1892 as compared with preceding years, we may rest assured that it is because the figures at the disposal of the statistician are capable of no other interpretation, and not because the compilers have labored to "boom" the State or their office. The figures which follow are gleaned from the comparison of 1891 with 1892 in the "Rubber and Elastic Goods" industry. It is to be understood that it does not purport to cover the whole industry in the State, but only certain leading establishments from which detailed reports have been received:

	1891.	1892.
Number of establishments reporting	33	33
Number of private firms	19	17
Number of partners in same	34	30
Number of corporations	14	16
Number of stockholders	735	719
Capital invested	$12,379,013	$10,629,092
Value of stock used	$10,990,067	$11,491,217
Value of goods made	$18,855,920	$20,300,517
Average number of employés	6,404	6,850
Total amount paid in wages	$2,793,252	$2,882,488
Average yearly earnings	$436.17	$420.80

It is not to be inferred from this table that there has been an actual withdrawal of invested capital from the rubber business. The Massachusetts reports include as "capital" much more than the capital stock in any establishment—cash, stock on hand or in process of manufacture, etc. Inasmuch as some of these elements are variable, fluctuations must appear in the reports from year to year.

Under the heading "Hose: Rubber, Linen, Etc.," four establishments show for 1892 capital invested to the amount of $795,681 (a decrease from 1891); stock used, $587,195 (increase); goods made, $956,568 (increase); average number of employés, 260 (increase); total amount paid in wages, $112,824 (increase); average yearly earnings, $433.94 (increase).

The following figures show the average prices reported for material used in rubber-factories, for the two years:

	1891.	1892.
Pará rubber (100 pounds)	$60.74	$52.79
Old rubber (100 pounds)	4.07	4.02
Rubber thread (100 pounds)	137.05	124.23

During 1892 twenty-two out of thirty-three rubber factories were in operation for 300 days or more. During 1891 only eighteen were in operation so long.

OFFICIAL CATALOGUE OF EXHIBITS, WORLD'S COLUMBIAN EXPOsition. Part XV.—Leather and Shoe Trades Building. Chicago: W. B. Conkey Co. 1893. [Paper. 8vo. 28 p., with map. 10 cents.]

THIS catalogue has been sent to us with the request that it be noticed, on account of the rubber-goods displays in the building named. It forms a section of the complete official catalogue of the World's Fair of which we already possessed a copy. The science of cataloguing is still in its infancy, and doubtless the compilers of the World's Fair catalogue would have been pleased to turn over their work to any critic who imagined himself able to make a catalogue more complete and better arranged. The fact remains, however, that one interested in a given class of exhibits—for instance, India-rubber—can find what is in the World's Fair buildings in less time and with less vexation by walking through them at random than by looking into any catalogue that has ever been published. It is true that if a visitor to the Fair should know that a certain exhibit existed in a certain building he might be assisted in finding it by the catalogue. But going into the Fair-grounds without knowing definitely what to look for, the catalogues would give little help. There is in the Leather and Shoe Trades building an extensive display of crude India-rubber made by the Brazilian States of Amazonas, Grao Pará, and Ceará, and by individual citizens of those States. There is, however, not the slightest reference to it in the catalogue which has been sent us. In the same building is a most creditable exhibit of mechanical rubber goods which is described in the catalogue in these words:

9. Schwanitz, Carl, Berlin. Fire hose, belting, etc. 699.

Is it to be wondered at that an exhibit so inadequately listed should have escaped the notice of more than one purchaser of the catalogue whose object was to learn what the Fair contained in the way of rubber exhibits? Not a little blame attaches, however, to the exhibitors themselves, who, by insisting upon working apart from each other, succeeded in scattering their displays so widely that it is a task to find everything in any class which may be named.

HIGH ART IN RUBBER GOODS. THE WOONSOCKET RUBBER CO.'S Fine World's Fair Display. [Reprinted from the New York *Times*, July 16, 1893.]

A WELL-WRITTEN account of the exhibit made at the World's Fair by a great rubber company, which was so attractive as to lead the newspapers to devote a great deal of space to it as a matter of general interest.

TRADE AND PERSONAL NOTES.

THE Goodyear Mechanical Rubber Co. are a new concern at No. 536 East One-hundred-thirty-fourth street, New York. The prime mover in the new enterprise is A. Straus, who was formerly with the New York Belting and Packing Co. They use two floors of a large building, the dimensions of which are about 100 by 100 feet, and provided with elevators. They are manufacturing mechanical rubber goods and making a specialty of vulcanite emery-wheels. The plant consists of two Stearns engines, 125 horse-power each; three boilers, 100 horse-power each; six grinders; two calenders; five vulcanizers; five hydraulic-presses of Birmingham make, and three tubing-machines. The presses are different from any other in use at the present time, as they have very large plates and are capable of turning out a great deal of work. In addition to this is a large machine-shop fitted with the finest lathes and planers and the latest appliances for doing general work in the factory. It is also specially fitted for making molds, which they do for themselves and also for outside parties. About sixty men are employed and orders are coming in rapidly.

—The Essex Rubber Co. (Newark, N. J.) are exceedingly busy at present, running their mills twelve hours a day.

—The report that there was to be a rubber factory at Pemaquid, Me., was an error. Nothing of the kind has been projected.

—Webster Norris, who for a number of years has been chemist for the Boston Rubber Shoe Co., and who has also invented several mechanical devices used in the manufacture of rubber shoes, prominent among which was the micrometer dial-gage has been made assistant superintendent of Factory No. 1, of the Boston Rubber Shoe Co.

—Phelps & Dingle, bicycle-tire manufacturers of Passaic, N. J., have made an arrangement to manufacture a new tire they have designed, at the works of the Boston Woven Hose and Rubber Co. (Cambridgeport, Mass.), and will sell it from that company's Boston office.

—A. W. Stickney, of the Wellman Sole-Cutting Machine Co., will go to Europe this month to place sole-cutting machines in the Liverpool Rubber Works. While he is abroad he will also go to France and probably visit the large rubber works in St. Petersburg.

—G. M. Knowlton, of the Boston Woven Hose and Rubber Co., is having a very large trade in the Knowlton packing, of which he is the inventor. He has just returned from a trip to the Dominion, where he has several large customers.

—The Metropolitan Rubber Co. have always shown a great deal of taste in their window dressings of their store on Summer street, Boston. A late attraction is in the form of four small showcases that are hung just below the principal show-window, containing a variety of smaller goods such as toys, sundries, and samples of the more attractive articles that they have in their store.

—The city trustees of Berkeley, Cal., have accepted the bid of the Goodyear Rubber Co. for 1250 feet of hose at 96 cents a foot, and of the Bowers Rubber Co. for one 60-gallon chemical engine for $650.

—The American Rubber Co. have placed two "Jumbo" arctics on exhibition in the warerooms of William Morse & Co. on Reade street, New York, which serve as excellent signs. Each one is composed of about twenty-five pounds of rubber and a full yard of cloth, and they are in shape and detail ready for the use of any one who has the feet to fill them.

—The new station for the Lynn (Mass.) Gas and Electric Co. will be built by the Berlin Iron Bridge Co. (of East Berlin, Conn.) The dynamo-room is 58 feet in width and 157 feet in length, the whole space being controlled by a traveling crane. The boiler-room will be 48 feet in width and the same length as the dynamo-room. The roof of this building will be entirely of iron, constructed under the well-known patent of the Berlin company.

—The Gormully & Jeffery Co. (Chicago), the extensive manufacturers of bicycles, have established a factory at Coventry, England, at which they have commenced to make pneumatic tires.

—The Swedish rubber factory for the manufacture of rubber boots and shoes is reported as running full and turning out a very nice quality of goods.

—The Steamer *Alvo*, which left New York on August 16 for Cartagena, has not been heard from and is supposed to have been lost. The steamer belonged to Pim, Forwood & Co., and was one of the Atlas line steamers, which carry nearly all the rubber coming to New York from Colombian ports. Her cargo on the last trip consisted of provisions of all kinds.

—The Commonwealth Rubber Co. (No. 54 Vesey street, New York) sent out under date of September 29 two notices, as follows: [For the city trade] "We take pleasure in announcing that our Mr. Addison F. Roberts has accepted the management of our city sales department and will call upon you, in the near future, with samples and prices of our several lines."—— [For the outside trade] "At our request Mr. Addison F. Roberts has accepted the management of our city sales department. Our president's son, Samuel F. Randolph, Jr., will hereafter represent us in your city, and will shortly call upon you with samples and prices of our several lines."

—E. H. Paine is now selling agent for both the American and the National India Rubber companies.

—The Woonsocket Rubber Co. have hired a storehouse on Congress street, South Boston. It has six floors and basement. The cars run directly into the building from the New York and New England railroad, thus making a direct connection between the mill at Woonsocket and the building. The Wales-Goodyear Co. have hired a portion of the building which will be equally convenient for them as regards railroad facilities. The building is finely equipped with electric lights, automatic sprinklers, and two elevators, making it one of the finest storehouses in Boston.—*Boot and Shoe Recorder*.

—The Gleason & Bailey Manufacturing Co. (Seneca Falls, N. Y.) have been awarded contracts for two large hose-wagons for Rutland, Vt., for a modern steel-frame hook-and-ladder truck for Westville, Conn., and for a modern crane-back hand fire-engine and fancy hose-cart for Boonton, N. J. They recently shipped a hose-carriage to Mellette, S. Dak., and a hose-wagon to the Pawcatuck fire-district, near Stonington, Conn. They are building an elaborate hose-jumper for the Liberty Hose Association, of Hackensack, N. J., and a steel-frame hook-and-ladder truck for Bellport, N. J.

—Business at the Boston Rubber Co.'s works at Franklin, Mass., is reported good, and it is said that the large orders received since reopening the works will insure the employment of the full force of hands at steady work for some time to come.

—The Tyer Rubber Co. (Andover, Mass.) are running full time. For two months they ran only four days in the week, but large orders which have recently come in will, it is said, test the full capacity of the works.

—Breck Brothers, dealers in rubber goods at No. 391 Main street, Springfield, Mass., have applied for admission to the board of trade of that city.

—The Goodyear Rubber Co., No. 421 Nicollet avenue, Minneapolis, Minn., have applied to the city for a building permit for inside alterations to their store, to amount to $1500. This is a branch of the Goodyear Rubber Co., where a full line of mackintoshes, shoes, druggists' sundries, rubber belting, and hose is carried. It is the largest house of that sort in the State.

—The "Alice" rubber mill, at Woonsocket, R. I., began the month with 1500 people at work, which, it is stated, is the largest number employed since the establishment of the mill. The amount paid each month to the help is reported by the local newspapers at between $60,000 and $70,000.

—The Williamsport (Pa.) *Republican* publishes an editorial paragraph by way of compliment to Mr. S. N. Williams, manager of the Lycoming Rubber Co., which was one of the few concerns in the country not forced to shut down during the summer. Mr. Williams is not only a successful rubber-manufacturer, but he finds time to use his position as a member of the City Council to advance public improvements.

—Charles F. Alcott, a rubber-stamp manufacturer at Milwaukee, Wis., has made a voluntary assignment to Joseph M. Alcott.

—It is reported that the National India Rubber Co. have a contract for 2000 army blankets for the government.

—Three cracksmen attacked "Dick" Whiting, night watchman at the works of the Erie Rubber Co., and bound and gagged him. They then drilled the office safe, but found inside only $15 and a few postage stamps.

—The Rhode Island Coupling and Rubber Co. (Providence, R. I.) made an assignment on September 14 to R. O. Whitney, for the benefit of their creditors. The house was established more than twenty years ago, and in March of this year was incorporated as a stock company. P. S. Remington, the manager, states that the failure was largely due to the stringency in the money market. There are few local creditors, the majority being New York, Bridgeport, and Boston concerns. The liabilities are estimated at between $18,000 and $20,000. At the time of the failure it was announced that the assets could not be reported before the taking of an inventory, and that a meeting of creditors would be held to take action upon the failure. If a satisfactory settlement was made, it was expected that the concern would continue to do business.

—Boston newspapers of late have been full of the discovery of a mercury mine in Lynn, Mass. They have also had considerable to say about John Raddin, the owner of the land on which the alleged mine is located. One of the things stated in regard to Mr. Raddin is that he first devised rubber tires; that he used them on a buggy several years ago, and now gets royalty from all persons using rubber tires. If this were a fact, John Raddin should be a millionaire many times over. It is needless to state, however, that there is a very small element of truth in the statements about Mr. Raddin's use of rubber tires. He may have been an early user of them, and he may even have been an inventor of some special type of tire, but further than this he cuts no figure in the tire business.

—The Candee Rubber Co. (New Haven, Conn.) have served papers upon W. D. Bishop, Jr., at Bridgeport, in a suit for $10,000, the alleged damage in the fire of July 8, when the Consolidated freight-yards at New Haven were burned. This will be a test case. Hitherto the Consolidated road has evaded suits for damage caused by the fire by declaring it was "the act of God."

—The Colchester Rubber Co., in a circular dated September 13, announce an increase in the gross price of the Colchester "spading boot" to $3.45 and $2.80 for men's and boys' sizes respectively, less 20 per cent. discount, making the net price $2.76 for men's and $2.24 for boys'. The circular states: "It is not to take advantage of the immense popularity of our 'spading boot' and our inability to fully supply the demand, that we feel it necessary to raise the price at this time; but it is in view of the greater cost over the common diamond tap boot that we now add that extra cost to the selling price."

—It seems especially fitting that Harry Hall should be again in the rubber business. His father did a great deal toward building up the retail trade in Boston, and acquainting people with the desirability of rubber wear of all kinds. That his son should reap some benefit from this is no more than right.

—George H. Hood, of the Boston Rubber Co., who has recently returned from a trip to Europe, mentions that he noticed a decided anxiety on the part of English manufacturers to get at American markets.

—W. N. Farwell has taken the New England agency for the Empire Rubber Manufacturing Co. (Trenton, N. J.) He has made arrangements with W. R. McKee & Co. to carrya stock and handle the accounts, the stock-rooms being at No. 294 Devonshire street, Boston.

—Mr. William J. Cable, of the Cable Rubber Co. (Boston) has gone to the Carriage Makers' Convention in Chicago, and will incidentally have a look at the World's Fair.

—The Hope Rubber Co. (Providence, R. I.) have a notable exhibit of mackintoshes and general rubber goods at the Rhode Island State fair. Manager Himes is advertising the goods for the company very successfully by means of blotters and fans which are distributed broadcast.

—Mr. J. O. Stokes and family (Home Rubber Co., Trenton) are in Chicago visiting the World's Fair.

—The Fossil Flour Co. are putting up a plant in Portland, Me., especially for the purpose of preparing their product for the rubber trade. They expect to be ready to fill orders within a month.

—Mr. F. F. Silliman, of the Cable Rubber Co. (Boston) is at the World's Fair, and, from his letters home, is evidently enjoying himself thoroughly.

—The Norfolk Rubber Co., Boston, are in a most cheerful frame of mind, as orders are coming in rapidly. As Treasurer Eustis says, "they are still doing business at the old stand."

—The United States Rubber Works (No. 2 West Fourteenth street, New York) are having a large run on cravenette goods. In addition to this their retail trade in mackintoshes is exceedingly satisfactory, and they have a large stock for Fall trade.

—Mrs. Spaulding, the manager of the Goodyear Rubber store, No. 71 Broadway, Brooklyn, N. Y., is broken down by overwork and starts soon for Denver, Col., for recuperation.

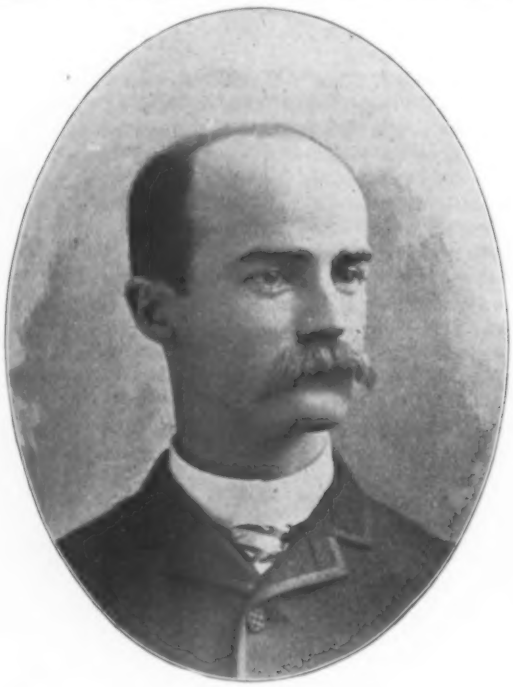
—C. D. Place (Metropolitan Rubber Co., New York) is taking a ten days' trip to the West, part of which time will be spent viewing the beauties of the Fair.

—The "Snagproof" boot, manufactured by the Lambertville (N. J.) Rubber Co., is as popular as ever this season. The factory is taxed to its utmost capacity to keep in sight of present orders.

—Weather-Prophet Devoe, whose predictions appear in the advertisement of the Commonwealth Rubber Co., was a recent visitor to the office of THE INDIA RUBBER WORLD. He calls attention to the fact that a year ago he predicted a storm in Texas and Mexico, which appeared within a week of the date he gave and caused considerable damage. He predicts that October is to be an unusually cold month.

RUBBER SALESMEN ON AND OFF THE ROAD.

THE portrait on this page is that of Mr. E. R. Burley, well known as the Western agent of the Boston Rubber Co., at Chicago. He is a native of Illinois, and was educated at St. Charles, in that State. The principal difference between his early school days and those of many other boys, who have since entered the rubber trade, is that he had as a schoolmate a little Miss Leonard, now known to the operatic world as America's peerless and lovely prima donna, Miss Lillian Russell. Mr. Burley first clerked for a retail dry-goods house in St. Charles. In January, 1880, he went to Chicago and entered the employment of the great firm of Field, Leiter & Co. as salesman. Later, when the concern became Marshall Field & Co., he was put in charge of the rubber-clothing department,—a very large department of this house, though the line at that time consisted of nothing but the regular heavy line of clothing and a fancy back check or an old-gold serge or stripe, and gossamers. It was while in this position that Mr. Burley became familiar with the Boston Rubber Co.'s line of clothing and also



E. R. BURLEY.

became acquainted with the late George H. Hood, Jr., who was selling goods to the Chicago house at the time. After being five years with Marshall Field & Co., Mr. Burley, in January, 1885, accepted the position as Chicago agent for Boston Rubber Co., where has been ever since, with credit to himself and to his company. Prior to that date the Boston Rubber Co. had no resident representative in Chicago.

Mr. Burley's special stronghold is the large carriage-builders' trade, and it is safe to say that he sells more yards of rubber carriage drill and duck in a season than any one man in the line. He also has a good trade in clothing with the largest jobbers in the West, and is well and favorably known to all the buyers in the large cities in his territory. Mr. Burley is a careful and persistent worker, and strikes the observant buyer with a characteristic without which no salesman is a success, *sincerity*. During his long career with the Messrs. Hood he has visited all the cities of this country and has been able to build up and hold a growing trade.

Mr. Burley may be described as a typical Chicago man in the best and fairest sense of the word. He is a thorough believer in the greatness of Chicago and her colossal and successful undertakings. His friends are of that stripe which, friends once, are friends always. He is married and lives with his family in Elmhurst, a suburb of the World's Fair city.

* * *

SHORT TRIPS.

GILBERT CONGDON was in Omaha recently with his handsome line of mackintosh samples of the Cleveland Rubber Co.

—William E. Wepham is on his long trip South, pushing the Hodgman mackintoshes, which have a great reputation among the best-dressed Southern gentlemen.

—E. A. Peacock is no longer with the New York Belting and Packing Co., nor is Mr. E. C. Deardorff. Both of these Western gentlemen made many friends in New York, and were well and favorably known on the road. Mr. Peacock was formerly employed in Chicago and Mr. Deardorff was with the Cleveland Rubber Co.

—James Mulconroy, of the progressive firm of Latta & Mulconroy, Philadelphia, paid Boston a flying visit recently and met many of his friends in the Hub.

—E. P. Jones, now with W. L. Sage & Co., Boston, is selling rubber footwear exclusively, in Maine and New Hampshire. Mr. Jones formerly sold leather boots and shoes also.

—William H. Daffron is in eastern North Carolina for the Patapsco Rubber Co., of Baltimore. He reports the demand for shoes very fair but clothing is very quiet. The heavy advance in cost of rubber boots is pushing leather boots to the front again in his section.

—Floyd Savage is working Pennsylvania for the Stephen Ballard Rubber Co., of New York.

—W. A. Walker, manager of the J. Mandleberg & Co., Limited, New York store, is on the road with the latest novelties from England in mackintoshes.

—Thomas P. Fogarty, of McDonnell, Payne & Co., is at home again in Baltimore after a good trip West, but he will remain only a few days.

—D. R. Westervelt, one of the road veterans for the Goodyear Rubber Co. (New York), is in the Southwest doing well, as usual, with the large line handled by his company.

—William H. Corner, Jr., while in Chicago, met many of his old friends in the rubber trade and they helped to make his visit a most pleasant one. Mr. Corner thinks Chicago the best city in the union for the rubber trade in general, and during two wet days while he was there the demand for clothing was simply enormous in a retail way.

—The Boston Rubber Co. were well represented in Chicago during the first week in October. Besides Messrs. F. C. and A. N. Hood, Mr. E. I. Aldrich, of the Boston office, and William H. Corner, Jr., New York agent, met the Western representative, Mr. E. R. Burley, at his headquarters. Mr. Burley played the part of guide at the World's Fair in a manner that showed him perfectly familiar with the vastness of the White City, and his knowledge of how to get out of the grounds at night, after some of the big buildings were dark, without walking an extra mile, was greatly appreciated by his Eastern visitors.

AN ANGLER'S SWORN AFFIDAVIT.

EVERY fisherman, no matter how successful or how punctiliously veracious, is at times pained by the coarse incredulity and clumsy comment with which his narration of actual experience is received. The trite suggestion of a visit to a fish-market; the threadbare joke about the biggest fish always escaping; the callow comment upon bottled bait and double vision are well nigh unendurable. A notable fisherman of the Providence Plantations, appreciating this state of affairs, has headed it off in a manner original and effective. In a letter to a friend he says:

About three weeks ago I went to a little place near Providence, and from half past 9 until 1 o'clock killed ten small mouthed bass that weighed 21½ pounds; six of them weighed 15½ pounds. When you beat that average, call again. Yours truly, W. S. BALLOU.

Providence, R. I., September 8, 1893.

Subscribed and sworn to before me
the 8th day of September, 1893. [L. S.]

JOHN J. CONNLY, Notary Public.

THE "FICUS ELASTICA" IN SAMOA.

TO THE EDITOR OF THE INDIA RUBBER WORLD: I find here at the World's Fair, in the Lahore exhibit and also in the French colonial exhibit, samples of rubber produced from the *Ficus elastica*, which appear to be of very excellent quality. I reside in Samoa and we have out there a great number of these trees which we have never considered of any value to us. I am perfectly satisfied that our trees are the same as that used in Lahore and in New Caledonia, and that the enterprise of working them needs only to be started to prove profitable. I shall be pleased to hear from any one as to the best way of working this tree for its product, and also as to the value of the crude rubber obtained from it. Until the end of the fair my address will be South Sea Island Village (of which I am manager), Midway Plaisance, Jackson Park, Chicago. After visiting California I expect to reach Samoa by January 1.

Very truly yours, H. I. MOORS.

Chicago, Ill., October 6, 1893.

HE SHOULD CALL FOR CRAVENETTE.

TO THE EDITOR OF THE INDIA RUBBER WORLD: A customer wishes us to make him a suit of waterproof cloth —a cheviot made with some sort of chemical which he saw at the World's Fair. The goods, from his remarks, would seem to be entirely different from the character of material from which mackintosh coats are made, in that there is no rubber used in their manufacture. Can you put us in communication with a firm handling these cheviot suitings? Very respectfully,

W. A. MAU CO.

Cincinnati, Ohio, October 2, 1893.

THE BICYCLE-TIRE INDUSTRY.

CAPITAL to the extent of $100,000 is said to have been invested in a new tire company, which has been incorporated in New York, under the name of the Spangler Pneumatic Tire Co. The tire is the invention of Albert E. Spangler, of Syracuse, N. Y., whose patent, No. 504,819, bears date of September 12, 1893. The tire is of the inner-tube order, no wires, springs, or cement being used, and the tire not being held in place by inflation. Mr. Spangler is known as the inventor of the Spangler cartridge-crimper, which attained a great success. It is understood that the tires will be manufactured by the B. F. Goodrich Co. (Akron, Ohio) and that orders are already in hand from a big bicycle-manufacturing concern for 20,000 tires.

ADDITIONAL TRADE NOTES.

RECENT visitors to the World's Fair have been Hon. E. S. Converse of the Boston Rubber Shoe Co., and Mrs. Converse; Mr. William B. Banigan of Providence, R. I., with his bride; Chester Pike, of the Wales-Goodyear Co.; Manager J. O. Stokes, of the Home Rubber Co. (Trenton); Mr. J. L. Allen, of the Enterprise Rubber Co. (Boston); and Mr. G. L. Richards, of the Boston Rubber Shoe Co.

—Charles T. Wood and J. M. Plummer, when not out among their trade, may be found at the store of the Stoughton Rubber Co., Summer street, Boston, which is now their New England headquarters.

—Thomas Harney, salesman for the Tyer Rubber Co., is back from a Western trip and getting up new samples preparatory for another start on the road.

—Messrs. Marr, Gaylord, Halladay, McGovern, and Baker, of the Stoughton Rubber Co., are all on business trips in various parts of the country.

—The Elliott Cressons gold medal of the Franklin Institute of Pennsylvania has been awarded to A. A. Marks, No. 701 Broadway, New York, as an evidence of the excellent quality of the artificial limbs manufactured by this house. The results attending the use of artificial legs with rubber feet applied to difficult stumps were discussed by the committee of the Institute to whom the matter was referred.

—The Commonwealth Rubber Co. (New York) have started a new department in connection with their mechanical-goods business, which they call the maritime department. This will be in charge of Capt. T. R. Lane and his son. The captain is exceedingly well known among owners of vessels and has taken this department with the idea of furnishing mechanical goods to tug-owners, steamship captains and others who go to sea.

—In a note to the editor of THE INDIA RUBBER WORLD, Treasurer B. F. Pennington of the Standard Rubber Corporation (Brockton, Mass) says: "Business is very encouraging with us, something we are very glad to chronicle as showing that one by one the rubber manufacturers are getting back to the usual good times."

—Frank E. Hall has taken an office at No. 33 Bedford street, Boston, and will handle the "Bonsilate" button for New England. Mr. Hall's salesmanship and popularity are well appreciated in the rubber trade, and he will without doubt receive large orders from the mackintosh-manufacturers.

—C. F. Holcomb, treasurer of the Canfield Rubber Co., may be found in New York every Monday at their office in Warren street. The rest of the time he is at the Bridgeport factory.

—The "Pearl" corset-shield is displayed in a very handsome case at No. 23 Union Square, New York. The water color that attracts wide attention to the shield is some of the work of the inventor, Mr. Eugene Pearl, who is an artist as well.

—The friends of Mr. E. A. Sprague, of the Cable Rubber Co., will be filled with sympathy to learn of the loss of his wife.

—Mr. Cheever K. Dodge, formerly with the F. J. Kaldenberg Rubber Co., has taken charge of the mechanical goods department of the Metropolitan Rubber Co., and may be found at their New York office.

—Quick work in filling an order was recently shown by the Globe Rubber Works (Trenton). Mr. George A. Austen, proprietor of the Imperial Rubber Co., New York, telephoned them for certain rubber goods at 6.15 in the evening. The stock was calendered, cased, cut and on the Philadelphia and Reading train at one o'clock the following morning. It reached New York at 3, where a truck was in waiting and at 5 A. M. the goods were in the hands of the purchaser.

REVIEW OF THE RUBBER MARKET.

DURING the last month the rubber market has been firm but quiet. There was an upward tendency at first, but prices went down again, and, on the whole, prices may be said to have been steady. The buying continues to be of a retail character, the manufacturer scarcely venturing to take large orders. There is no immediate prospect of improvement, owing to the uncertainty hanging over the financial situation. The failure of the Senate to act upon the Repeal bill is having a discouraging effect on business in general, and the rubber trade reflects the general situation. The demand for African rubber and all medium grades has been fair. The exports have been light, though business in Europe is much better than here, and the deliveries there have been large. The communication with Brazil is again regular and unobstructed.

The world's visible supply of Pará rubber on September 30, 1893, compared with a date one month before, and one year before, was as follows, amounts being stated in tons:

	September 30, 1892.	August 31, 1893.	September 30, 1893.
United States....	733	792	700
England	670	594	709
Pará.....	535	600	450
Afloat.....	715	473	750
Total....	2653	2459	2609

Receipts of rubber of Pará from June 30 to September 30—the first three months of the new crop year—are 3550 tons, compared with 3415 tons for the same period of 1892.

Exports of crude rubber from the United States to Europe during September amounted to 109 tons.

The statistical position of Pará rubber in New York is thus reported for September, 1893, as compared with the same month in preceding years:

Stock of Pará here,	August 31,	about	1,625,000 pounds.
Receipts	September,	"	685,000 pounds.
Deliveries	September,	"	960,000 pounds.
Stock	September 30, 1893,	"	1,350,000 pounds.
Stock	September 30, 1892,	"	1,450,000 pounds.
Stock	September 30, 1891,	"	1,160,000 pounds.

PRICES FOR SEPTEMBER.

	1893.		1892.		1891.	
	Fine.	Coarse.	Fine.	Coarse.	Fine.	Coarse.
First..	66	43	63	42	62	42
Highest..... ...	70	49	67	45	64½	45
Lowest.....	66	43	63	42	61	39
Last.....	70	49	67	45	64½	44½

The latest quotations in the New York market are:

Pará, fine, new.....	69@71	Sierra Leone.....	25@40
Pará, fine, old.....	73@75	Benguela	48@49
Pará, coarse, new.....47½@53		Kongo Ball.....	36@42
Pará, coarse, old.....	49@55	Small Ball.....	33@36
Caucho (Peruvian) strip..	48@49	Flake, Lump and Ord....	28@29
Caucho (Peruvian) ball...	52@53	Accra Flake.....	18@19
Mangabeira, sheet.....	36@40	Madagascar, pinky.....	56@58
Esmeralda, sausage.....	48@49	Madagascar, black.....	38@41
Guayaquil, strip.....	35@42	Borneo.....	26@42
Nicaragua, scrap.....	46@48	Gutta-percha, fine grade..	1.30
Nicaragua, sheet.....	44@45	Gutta-percha, medium...	1.00
Thimbles	39@40	Gutta-percha, hard white.	85
Tongues.....	34@37	Gutta-percha lower sorts.	nominal.

In regard to the financial situation Messrs. Simpson & Beers, brokers in crude India-rubber and commercial paper, New York, advise us as follows:

"Since our last report and throughout September our banks have increased their reserves some $25,000,000,—but as there are still some $24,000,000 of clearing-house certificates outstanding our banks have mostly refrained from buying outside paper. If the Senate would act favorably on the silver question, there would soon be a freer demand for prime commercial paper at 6 per cent. As it is, rates have been, while lower, irregular, at say 7 @ 7½ per cent. for first-class endorsed paper and 9 @ 12 per cent. for single, four-months' maturity, with the business largely from out-of-town banks."

THE UNITED STATES RUBBER COMPANY.

THE New York Stock Exchange has listed the additional issue of stock of the United States Rubber Co., in compliance with an application made through its officers, as follows:

"Referring to the applications of the United States Rubber Co., dated December 1, 1892, and May 12, 1893, under which you listed $19,251,600 preferred stock and $19,842,600 common stock of this company we now beg to advise you that we have issued a further amount of stock—namely, 1490 shares of preferred and 3234 shares of common, or $149,000 of preferred stock and $323,400 of common stock.

"These shares have been issued in payment of $400,000 of stock being the total capital stock of the Colchester Rubber Co., of Colchester, Conn.; and for $149,000 of stock of the Rubber Manufacturers' Selling Co., of Colchester, Conn., being the balance not previously purchased by us, and making, with the $151,000 formerly purchased, its entire capital stock of $300,000.

"We respectfully request that these 1490 shares of preferred stock and 3234 shares of common stock be added to to the list. These additions will make the respective totals as follows: Preferred stock, $19,400,500; common stock, $20,166,000. Respectfully yours,

"ROBERT D. EVANS, Vice-President."
"CHAS. R. FLINT, Treasurer."

The quotations which follow represent the daily transactions in Rubber stocks on the New York Stock Exchange for each business day since the last report printed in this journal:

DATES.	COMMON.			PREFERRED.		
	Shares.	High.	Low.	Shares.	High.	Low.
September 11..	100	35	35	....	....	....
September 12..	150	35	35	....	....	....
September 13..	...	...	....	....	....	....
September 14..	10	38	38	24	76	75
September 15..	....	....	....	....	....	....
September 16..	....	...	.. ..	....	....	....
September 18..	10	35	35	...	....	....
September 19..	150	33	33	...	....	....
September 20..	....	....	....	....	....	....
September 21..	....	....	....	....	....	....
September 22..	130	33	33	....	....	56
September 23..	....	. ..	....	....	....	....
September 25 .	....	....	....	10	77	77
September 26..	500	30⅛	30	....	....	....
September 27..	...	....	....	....	....	....
September 28..	225	30	30	...	....	....
September 29..	....	....	....	120	75	75
October 2.....	400	32	32½	....	....	...
October 3.....	....	....	....	....	....	....
October 4.....	450	32	32	5	77	77
October 5. ...	9	32	32	....	....	....
October 6.....	....	....	....	....	....	....
October 7.....	....	....	....	....	....	....
October 9.....	50	32	32	....	....	....
November ...	31,208	44	38¾	....	....	....
December.....	15,943	48	39	2,607	99	94½
January	9,604	47¾	42½	5,521	99	94
February	7,024	46¼	43	1,333	97	92½
March.....	30,438	58¼	42	2,938	99	93
April	25,625	60½	53⅞	3,251	99½	94¾
May.....	24,999	57½	33	4,835	91	80
June.....	5,474	45⅝	34½	2,323	83	74
July.....	2,774	38¾	25	1,504	77	65
August.....	3,525	29	17	1,943	68	50
September	3,191	38	29	778	79	70

AFRICAN RUBBER—LIVERPOOL.

TO THE EDITOR OF THE INDIA RUBBER WORLD: The firmness in the Pará rubber market had more than the usual influence upon African grades during the past month, owing to their great scarcity. Arrivals have been very small during September, and have been quickly bought up. Importers have been enabled to clear some of their old stocks at good prices. The demand has been equally good for both hard and soft descriptions of rubber. Prime Accra Biscuits have been sold at 1/11 @ 1/11½, and the price of low Accra Paste has risen from 0/7¼ to 0/9. Soft Liberian has also been in good demand, and there are buyers at the close at 1/2. About twenty tons of Thimbles have been sold during the month at 1/7 @ 1/7½. We quote as follows:

	English price.	Approximate price laid down in New York.
Soft Liberian	1/2 @1/2½	28 @29 c.
Soft Liberian (pasty)	8½d@ 9d	17 @18 c.
Hard Liberian	1/4 @1/4½	32 @33 c.
Accra, Saltpond, and Cape Coast Biscuits of fair quality	1/10 @1/10½	44 @45 c.
Accra Biscuits best quality	1/11½@2/	47 @48 c.
Addah Niggers	1/9	42 c.
Prime Selected Sierra Leone Niggers	1/6	36 c.
Grand Bassam and Assinee	1/5 @1/6	34 @36 c.
Prime Gambia Niggers	2/1½@2/2	51 @52 c.
Mixed Cameroon	1/6 @1/6½	36 @37 c.
Large Cameroon or Batanga Ball	1/5½	35 c.
Best Kongo Ball	1/8½@1/9	41 @42 c.
Gaboon Ball (or second Kongo Ball)	1/7 @1/7¼	38 @38½c.
Thimbles	1/7½	39 c.
Flake	1/1 @1/1½	26 @27 c.
Lump Flake	1/1½@1/2	27 @28 c.
Prime Black Manoh Twists	2/3½	55 c.
Old Calabar	1/4½@1/5	33 @34 c.
Loanda Niggers	2/5 @2/5½	58 @59 c.
Benguela Niggers c. i. f. New York	1/10½	45 c.

In London, full prices have been paid for medium kinds. Fair usual quality Madagascar Niggers have been sold at 1/2¾, clean red Mozambique Ball at 2/1, and fine Columbian Sheet at 2/6¾ to 2/7¼. Colombian Scrap, white and dark, sold at 2/5½ @ 2/6¾. WM. SYMINGTON & CO.

Liverpool, September 30, 1893.

IMPORTS FROM PARA.

THE imports in detail of rubber direct from Pará at the port of New York, since our last report, have been as follows, all quantities being expressed in pounds:

September 25.—By the steamer *Hildebrand*, from Pará:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Joseph Banigan	57,700	12,700	46,500	3,700	120,600
Reimers & Meyer	37,300	11,100	27,300	8,900	84,600
Lawrence Johnson & Co.	22,800	1,400	25,300	24,400	73,900
Shipton Green	21,700	3,000	9,600	....	34,300
New York Commercial Co.	22,200	3,600	7,700	....	33,500
W. R. Grace & Co.	12,100	5,000	1,200	....	18,300
Total	173,800	36,800	117,600	37,000	365,200

October 10.—By the steamer *Lisbonense*, from Pará:

Reimers & Meyer	123,500	41,800	94,200	2,500	262,000
New York Commercial Co.	114,200	14,800	23,100	...	152,100
Joseph Banigan	46,800	6,800	55,400	....	109,000
Boston Rubber Shoe Co.	35,500	7,900	20,100	3,800	66,800
Shipton Green	18,100	2,400	6,600	....	27,100
Lawrence Johnson & Co.	11,400	1,800	5,400	...	18,600
G. Amsinck & Co	5,400	700	1,200	....	7,300
Total	354,400	76,200	206,000	6,300	642,900

September Imports of Pará rubber	757,200
August Imports	914,100
July Imports	579,200
June Imports	1,955,915
May Imports	1,367,600
April Imports	3,881,400
March Imports	2,107,600
February Imports	2,924,300
January Imports	3,349,000
December Imports	4,809,600

IMPORTS OF CENTRALS.

BELOW will be found in detail the imports at New York, during September, 1893, of India-rubber from Mexico, Central America, and South America, other than Pará grades:

	POUNDS.
SEPT. 4.—By the *Athos*=Colombia:	
Pim. Forwood & Co. (Cartagena)	7,800
Eggers & Heinlein (Port Limon)	1,200
Victor Frolich (Port Limon)	400
Total	9,400
SEPT. 4.—By the *Newport*=Colon:	
Bock & Co. (Panama)	1,577
Isaac Brandon Bros. (Panama)	2,500
[Ex *Manari*=South Pacific ports].	
C. Roldan & Van Sickel	3,015
Munoz & Esprella	4,217
W. R. Grace & Co.	1,410
Flint & Co.	1,662
G. Amsinck & Co.	10,952
A. Santos	1,100
To Order	872
[Ex *Laja*=South Pacific.]	
Hirzel, Feltman & Co	2,400
Total	29,705
SEPT. 6.—By the *Yumuri*=Central America:	
H. Marquardt & Co. (Tuxpan)	150
H. Marquardt & Co. (Vera Cruza)	150
Total	300
SEPT. 12.—By the *Alvena*=Port Limon:	
Ellinger Brothers	720
SEPT. 12.—By the *Colombia*=Colon:	
[Ex *San Juan*=Central America.]	
Munoz & Esprella	3,410
[Ex *Casma*=South Pacific ports.]	
W. R. Grace & Co.	2,050
C. Roldan & Van Sickel	3,000
[Ex *Imperial*=South Pacific ports.]	
Flint & Co.	3,700
Hirzel, Feltman & Co	3,100
Total	15,260
SEPT. 15.—By the *Carib*=Puerto Cortez:	
Eggers & Heinlein	5,736
W. R. Grace & Co.	110
J. Agostini	485
Total	6,331
SEPT. 17.—By the *Alamo*=Colon:	
G. Amsinck & Co. (Panama)	1,600
Piza, Nephews & Co. (Panama)	22,270
[Ex *San Blas*=Central America.]	
Munoz & Esprella	7,393
G. Pardo & Co	106
Hoadley & Co.	4,358
P. F. Cornell	2,646
W. R. Grace & Co	1,236
Lanman & Kemp	2,423
[Ex *Colima*=Central America.]	
J. M. Ceballos & Co	2,118
Total	44,150
SEPT. 19.—By the *Simon Dumois*=Boco del Toro:	
A. N. Rotholz	300
SEPT. 19.—By the *Prins William*=Surinam:	
Earle Brothers	3,500
SEPT. 22.—By the *City of Pará*=Colon:	
A. N. Rotholz	539
[Ex *San Jose*=Central America.]	
Jacob Baiz	1,095
J. Aparicio	2,945
To Order	2,850
[*Ex Puno*=South Pacific.]	
Hirzel, Feltman & Co	3,500
J. M. Ceballos & Co	7,879
Total	18,808
SEPT. 23.—By the *Miranda*=Central America:	
A. P. Strout (Greytown)	4,100
W. A. Crossman & Bro. (Greytown)	6,125
Hoadley & Co. (Greytown)	3,500
Eggers & Heinlein (Belize, Puerto Cortes, and Livingston)	380
Total	14,145
SEPT. 26.—By the *Premier*=Boco del Toro:	
A. N. Rotholz	600
SEPT. 27.—By the *Orizaba*=Vera Cruz:	
J. Agostini	125
Total Imports for September	143,364
Total for August	134,636
Total for July	293,526
Total for June	190,921
Total for May	257,481
Total for April	200,383
Total for March	277,459
Total for February	244,526
Total for January	222,308
Total for December	208,196
Total for November	297,100
Total for October	207,715
Total for September, 1892	140,756

BOSTON ARRIVALS.

	POUNDS.
AUG. 21.—By the *Philadelphian*=Liverpool:	
Boston Rubber Shoe Co., Africans	20,000
AUG. 22—By the *Borderer*=London:	
Ropes, Emmerton & Co., Madagascar	28,000
AUG. 28.—By the *Scythia*=Liverpool:	
Reimers & Meyer, Africans	10,000
Total Imports for August	58,000
*Total for July	119,100
Total for June	215,470
Total for May	172,664
Total for April	185,500
Total for March	221,400
Total for February	525,513
Total for January	309,640
Total for December	255,120
Total for November	297,100
Total for October	100,650

*Corrected since publication of August 15.

NEW ORLEANS.

AUGUST.

	POUNDS.	VALUE.
From Guatemala	6,379	$ 2,401
From Nicaragua	31,104	11,991
Total	39,483	$14,392

UNITED STATES RUBBER STATISTICS.

IN the latest monthly summary from the Bureau of Statistics of the Treasury Department the following statements are found of the imports of crude India-rubber and Gutta-percha for August, 1893, and for the first eight months of the year, compared with corresponding periods of 1892:

POUNDS.

	August.		Eight Months.	
	1892.	1893.	1892.	1893.
India-rubber	2,268,259	1,642,050	25,178,483	27,759,888
Gutta-percha	26,136	9,121	281,585	312,598
Total	2,294,395	1,651,171	25,460,068	28,072,486

VALUES.

	August.		Eight Months.	
	1892	1893.	1892.	1893.
India-rubber	$1,109,193	$675,962	$13,459,019	$11,786,610
Gutta-percha	9,527	3,990	102,036	84,022
Total	$1,118,720	$679,952	$13,561,055	$11,870,632

The note is made that, in comparing values, the figures used for 1892 are not those contained in last year's report, but the figures obtained by estimating the gold values of imports which were valued last year in the depreciated Brazilian paper.

The exports of crude rubber during January-August, 1893, amounted to 1,376,879 pounds, against 730,055 pounds for the same period of last year.

The exports of rubber boots and shoes for eight months were valued at $156,247, against $111,062 last year. Exports of all rubber goods for eight months reached $964,154, against $919,230 for the same part of 1892.

THE WEDDING OF A RUBBER-MAN.

MR. WILLIAM B. BANIGAN was married on October 4, in St. Matthew's Church, Washington, D. C., to Miss Emma Tyree, of that city. Cardinal Gibbons celebrated the nuptial mass, assisted by Rev. Father Lee, rector of the church. The father of the bride is Mr. Samuel Tyree, of West Virginia. There was a breakfast at the Elsmere after the ceremony, attended by relatives and immediate friends. Immediately after the breakfast Mr. and Mrs. Banigan left Washington for an extended tour, including a visit to the World's Fair. Their home will be in Providence, R. I., where the bridegroom has prepared a handsomely furnished house as a gift to his bride. Among the guests were the bridegroom's parents, Mr. Joseph Banigan (president of the United States Rubber Co.) and Mrs. Banigan, and also his venerable grandparents.

Mechanical Books.

Published by MASON REGULATOR CO., Boston, Mass.

These books are written by the best authorities on the subjects treated, in clear and concise language. Some of them have been published and sold by others, at much higher prices; but by purchasing in large quantities, obtaining the control of the copyright, we are enabled to offer them to engineers at nearly cost price, to ourselves. Unlike most publications of this class, they contain only our own advertisement, and it is with this end in view that we offer them at such prices. They are neatly and durably bound in leatherette. Any one of them sent postpaid on receipt of the price either in stamps, or money order.

No. 1. Key to Engineering, 92 pages, 30 cents.

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